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A JOURNAL DEVOTED
 TO BEES,
 AND HONEY,
 AND HOME
 INTERESTS.

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STENOG says, p. 45, he will willingly pay 40 cts. a pound for extracted Nevada alfalfa honey. He's likely to get the Nevada output.

WHEN HAULING BEES, tacks sprinkled on the platform, even two to a hive, will keep the hives from slipping about, says F. A. Gemmill, in *Review*. That may do pretty well in place of cleats nailed on the platform. [A capital idea.—ED.]

I'VE USED lots of dummies such as Bro. Doolittle describes, p. 52, an inch thick, and like them. But I now use dummies $\frac{1}{4}$ or $\frac{3}{8}$ inch thick, cleated at the ends, and like them better. In some cases it may take more, but they're nicer to handle, and sometimes one can be used where the thicker could not.

TO PREVENT cracks in a cake of wax, *Le Rucher Belge* recommends that, when cooling, it be covered with a cover having a hole in the middle, so that the center of the surface will cool first. A good way is to put the dish of melted wax in the stove oven at night when the fire begins to go down, and leave it there all night.

SOMETIMES you put candied honey or bees-wax in the oven of the cook stove to leave there over night. You're sure you'll remember to take it out when you start the fire in the morning, but never think of it again till that dreadful smell greets your nostrils. To prevent such a catastrophe, put the stove-handle in the oven at night, then you can't well forget it in the morning. [Doctor, you talk as if you had been having some very recent experience. If so, we will profit by it.—ED.]

HERE'S THE WAY C. A. Hatch managed 10-frame hives for comb honey, as given in *Review*: When time for supers came, he put the frames with eggs and unsealed larvæ at the outside; and the season being short these outside combs were not emptied for honey till it was over; and as the bees didn't want to store right in the middle of the brood-nest, the surplus all went into the super. [At first

thought, this strikes me as being a most excellent suggestion for either 10 or 8 frame hives; but, of course, in some localities and under some conditions it might not give very satisfactory results; but I should suppose it would work very nicely.—ED.]

SHALL EXTRACTING-COMBS be given to the bees to clean in the fall? is asked in *Revue Internationale*. Most of the repliers say no, if the combs are kept in a dry place. The sticky combs are less troubled with moths, and the bees will occupy them more promptly the next season. But it must be remembered that candied honey is in favor in Europe more than here, and the residue of honey in the combs left over winter hastens candying the next year. If you don't want candied honey in sections, let the bees clean dry in the fall all unfinished sections that are to be given to the bees the next year. [Here, again, locality has every thing to do with the matter.—ED.]

ACCORDING to German journals, Dr. J. Langer investigated 164 bee-keepers, and found 11 of them immune to bee-poison from the start; 126 became immune after a time; and 27 remained as sensitive as ever. Some lost their immunity each winter, and sometimes suddenly through sickness. [I have never yet run across a case of one who was immune from the start—that is to say, one on whom there was no swelling after the first sting. But I have known of instances where it would seem as if certain people could never keep bees, owing to the fact that the poison, in spite of the repeated doses of it, seems to act as disastrously as at first, not only producing swelling, but causing a sickness bordering hard on the dangerous.—ED.]

IRA BARBER says in *Review* that, when there is not enough snow on the ground to prevent freezing 2 or 3 feet deep, there will be no surplus from white clover. If snow covers the unfrozen ground all winter, the clover yields nectar whether the ground be wet or dry. That looks reasonable; but how about buckwheat? Like white clover it may bloom and not yield, but it has no roots the previous winter. [Snow probably does have a very decided influence on the growth of clover and its subsequent behavior the following season. In our locality we count on a large amount of

snow as being very favorable to the growth of white clover. A severe winter, with little or no snow, and with very little rain, is apt to be followed by a season of little or no clover; but, like every thing else in beedom, there are a good many exceptions to general rules.—ED.]

WE MAY SAFELY SAY that not more than one comb in 500,000 will be 25 years old, say you, Mr. Editor, p. 44. Been at the saloon again, eh? Wait somewhere from two to five years and you'll find that many right here in Marengo, if the number of combs in the country doesn't exceed a billion. [Yes, but you are one in ten thousand. In all my travels all over the country, doctor, I never ran across a man who had as many old combs as you have. The combs are not usually discarded because of age, but because of being either naturally built and so many drone cells, or because the frames have gone out of date, and their owners want newer fixtures. No, sir; I will stick to my original statement, that not more than one comb in half a million will be 25 years old. Of course, I have to except from this box hives and every thing that does not make use of movable frames.—Ed.]

A. CHARTON, who invented the Charton glossometer in 1892, gives in *Revue Eclectique* some figures that seem to indicate that bees store in proportion to the length of tongue. In 1897, 6 colonies, during 37 days, made the following gains, weights being given in kilograms, and measurements in millimeters. A colony with tongues measuring

7.4mm weighing 12k	gained 0.0
7.9mm " 11.5k	" 0.5k
8.1mm " 13k	" 0.5k
9.2mm " 12.5k	" 0.5k
9.4mm " 11.5k	" 5.5k
9.5mm " 12k	" 6.0k.

In 1900, two swarms of same date were compared. With tongues 9.5mm one swarm gained 47.3 lbs.; with tongues 7.3mm one swarm gained 33.7 lbs. And yet the short-tongued was a tenth heavier at the start than the other. [See answer to Prof. Rankin, in this issue, on the relation of the length of tongues to the amount of yield.—Ed.]

SUGAR as a ration for soldiers has had quite a boom in Germany. J Crepieux-Jamin reports in *Revue Internationale* that he has given it a trial on a cycling-trip and finds it good to fill in between the morning and the evening meal, but finds honey still better. With honey there is less thirst and clamminess in the mouth. After using sugar on the wheel Aug. 11 and 12, here's his dietary for Aug. 13: "Usual breakfast at 8. At 10:30, 60 gr. (about 2 1/2 oz.) honey. At noon, 70 gr. honey. At 2, 60 gr. At 4, 60 gr., and, having slight thirst, a cup of tea. Supper at 7.30. Excellent condition, good appetite, clear head." [In all my cycling experience, and it has been quite an extended one, I never made a test of any form of sweet, much less one with honey. In preparing for a long run I have made it my rule to eat in the morning, on starting out, a generous quantity of oatmeal and milk; at noon a good ration of beefsteak

and other solid food; and at night every thing I could find on the table that was good. If I could finish my ride with a strong appetite, I was all right; but in some of my later experiences my longest rides were completed with little or no appetite, and that was followed by a breakdown. While I believe most emphatically in honey, yet I think a cyclist needs something that is far stronger as a food.—ED.]

SYLVIAC, in *Revue Eclectique*, scouts the idea of a bee carrying a load weighing more than its own body. He says it can not carry more than its honey sac will hold, and gives figures to show that its heaviest load of nectar can not exceed one-fifth the weight of its body in its normal condition. [I suppose Sylviac never saw a bee carry away one of its fellows that had outlived its usefulness. The wing power of a bee is certainly great enough to carry its own weight of honey; but I think myself it is doubtful whether they ever carry more than half their weight in nectar. Prof. B. F. Koons, of the Connecticut Agricultural College, found, by numerous measurements that he had made, that bees could carry half their own weight in nectar; but ordinarily the average load is about one-fourth their weight. If I mistake not, these results were corroborated very closely by Prof. Gillette and Prof. Lazenby, the former of the Colorado Experiment Station, and the latter of the Ohio Experiment Station.—ED.]]

LET UP, Mr. Editor, and I'll take back what I said, p. 44, and say 1 1/2 is the right distance for spacing. Yes, for Hoffmans, 1 1/4 or less. Of course, I might reply to Weyprecht's measurements that Doolittle measured the same way and got 1 1/2; but I don't want to have any words with you about it. I'm willing to say to A. J. Fisher that, when his combs get to be 25 years old, he can increase the spacing; but as to saying that 1 1/8 is space enough—I draw the line right there. I won't say that for you or any other man. Why, 1/4 is the spacing between combs of honey, even when crowded. Would you ask the bees to do with less room between combs of brood? [Don't you remember the time, doctor, when I was measuring spaces between comb surfaces, and how I found in very many instances the space was only 1/8? It seemed to me as if half the measurements were of this spacing. Why, yes, if the bees are content with 1/8, why not let them have it under certain peculiar conditions?—Ed.]



I should like to ask Mr. Bonney or any other person who has tried his method of introducing queens if he has ever had any trouble from the queen killing the bees that are put in the cage with her. I tried that plan several years ago, and the queen made a vicious

and deadly attack upon every bee I put into the cage.

If you are interested in census matters, will you observe this about Los Angeles? In 1890 the city had a population of 50,000. In the last census (1900), 102,000. A little more than doubled its growth in ten years. Prospects for the future, great. Transcontinental railroads are heading this way; new harbor at San Pedro; a great oil industry; a wonderland.

Here is another argument for tin cans instead of barrels for honey. Freight rates on honey in tin cans cased, from California to the East, \$1.10 per 100 lbs. On honey in barrels, \$1.30 per 100 lbs. On honey in glass, \$1.30 per 100 lbs. Observe honey in barrels and glass is in the same class. The railroad companies evidently know where the greatest risks are.

Long-tongued bees are now the order of the day, and a desirable improvement where red clover is grown or where there are other long-tubed flowers; but here in California, where the flower-tubes are all comparatively shallow, I think the long tongue is not so much called for; but if extra length of tongue insures extra working ability we will take the long tongues. It is a healthy feature of the honey business when the value of the queen is looked after.

The bee-keepers in California, from Oregon to Mexico, have taken their harps from the willows, where they have hung for the past three years, and now they are harping a merry chorus, and all because the rains have fallen at the proper intervals. The hills and valleys are being clothed in green, and ere another month passes millions of flowers will be in bloom. Bee-men begin to talk about ordering cans for their prospective crop. Dealers are ordering carloads of supplies. If you wish to study the magic power of a raindrop, come to California.

Returning to Los Angeles I find the Belgian-hare business, which was booming nine months ago, dead as a door nail. A number of breeders have gone out of business; others are going out, or wishing they were out. As many predicted, as soon as the demand for fancy stock at fancy prices ceased it became a non-paying business. Those who believed Belgian-hare meat would compete successfully with beef, mutton, and pork have run up against a disappointment. It will not compete; and if there was ever a chance for such competition it would have been known long ago in England and on the continent, where the Belgian hare has been bred for years. Glad I did not go into the business.

Remarks are in order in what Mr. Shiber says about his experience with California sage honey, page 959. All hands in the transaction, from the producer to Mr. Shiber, may have been honest in their statements about there being sage honey. The trouble lay in the fact that it was not *all* sage honey. Pure sage honey will continue in a liquid state two and even three years, and perhaps longer. I speak of honey under my own observation. There

are, however, many localities where honey from other flowers is gathered at the same time, and it all goes under the title of sage honey. In fact, dealers are so reckless in the use of titles that much honey is sold under the name of sage that never was produced from a sage blossom. A grocer near me has a fine lot of comb honey piled up in attractive form on his shelves. The caption across the top reads, "New White-sage Honey." New in January, and it was produced in the northern portion of the State in an alfalfa district! It is the same with honey from the orange. Tons of orange honey is sold as such when it came from an entirely different source. An amusing label was found a few years ago upon some honey in the hands of an enterprising grocer. It was, "Pure California White-clover Honey." The amusing part comes in when you consider that there is scarcely an acre of white clover in Southern California. The fact in this matter of fictitious titles to honey on sale in groceries is that the grocer will put on any name that sounds well, suits the popular taste, and will sell his honey. The bee-keeper is innocent of any such chicanery.



The ruler of one-fourth our race,
Whose drum-beat sounded round the globe,
At last lays earthly honors down,
Old England's flag her robe.
For four and sixty years she's ruled
With woman's gentle sway;
The nations mourn the loss of her—
Hail Edward VII. to-day.



AMERICAN BEE JOURNAL.

For a New Year's present Mr. York received the destruction of his office by its being flooded by twenty fire-engines. The floor above was burned out. Fortunately the forms for the issue for Jan. 3 were in the hands of the printer, and these were not injured nor that issue. The loss is, of course, considerable, and the inconvenience great. The issue for Jan. 10 shows no signs of the calamity. Ten firms were in the building, and all suffered loss, the total amount of which will be toward \$100,000. Now is the time to help Mr. York by sending in arrearages, etc.



In speaking of the experimental apiary in the Garden of Luxembourg, Paris, Mr. Dantant says:

It was a disappointment. The spot is unique, for an apiary in the heart of one of the largest cities in the world. It is a very quiet corner, among the trees, the shrubs, and the flowers, in the aristocratic garden of the palace of the French senate, and the bees fly back and forth unmolested and busy. But there are only a few hives, in a rather dilapidated condition, and it is evident that no pains are taken with them. The keeper very kindly permitted us to look at everything. We found half a dozen different practical hives, rotting without occupants, while half a dozen straw skeps and two or three odd patents seemed the only

experimental feature. I inquired for an observation hive, and he showed me a hive with eight or nine frames with glass all around. What one could observe with such a hive is more than I could say. I was told that lessons in bee culture were given every two weeks, in this place, during the summer. I doubt that any experiments of value are ever made there. France can afford something better.

Mr. Dadant ascended the Eiffel Tower with his daughter and Mr. Calvert. After reaching the third platform, 1000 feet high, the view below flattens out. The monuments, the hills, the white ribbon of the Seine, seem only like a living map. The houses make a sea of red tiles, the river is a silver thread, and the parks are green spots here and there.

The wretched habit of tipping waiters, which is showing its hydra head in this country, is thus graphically described by Mr. Dadant:

I earnestly hope that we are not going to take the habit of "tipping" the waiters and servants as they do over there. It is sickening. You eat dinner—tip. You ride half a mile and discharge the cabman, pay—and—tip. You go to the theater, buy your ticket, and tip the ushers. You leave the hotel, tip the servants, the boot-black, the chamber-maid, the porter. Tip, tip, tip. Luckily they do not expect silver in every case, and this is the principal use of coppers. Two cents, three cents, make a very passable tip. If you give a dime, you get a smile. If you give a quarter, you get a fine bow. But if you give nothing, you had best not look behind, for a look of contempt will follow you till you are out of sight.



CO-OPERATIVE ORGANIZATION.

Plans Outlined; Intelligence Bureau; Why Simple Co-operation Fails; Business must be at the Bottom; Government's Duty.

BY R. C. AIKIN.

The first work in organizing is to make a head. From a head, or central place and body, go out and spread to all the people the benefits. We can not begin at the out edges and build in to the center, but the center first and then the outer parts.

My plan is that there be a business organization for the whole nation, with a general head at some stated place. In conjunction with this head will be branch offices in all the principal producing districts, and a system of communication between the central office and all the branches. This contemplates that no producing territory be left out—all must be constantly in touch with the central. Also the consuming districts must be in touch with the central office, that the needs of the consumer may be known too. We may call this phase of the plan an "intelligence organization."

It shall be the business of the central office to keep constantly in communication with all branches, and the branch manager shall distribute all necessary information to the individual producers. Each local or branch office shall report to the central the conditions of stock in spring, the progress of honey-flows, the harvesting of the crops, the movement of the honey, prices obtained, etc., and the central shall in turn give to the branches reports of all compiled.

The object of this reporting is that all concerned may know about the prevailing conditions. Just this fall, buyers were making quite an effort to make producers believe there was a large crop—at least enough so that they could buy all they needed, at moderate prices. The average buyer *can*, if he *tries*, know better than the average producer whether there is a good crop or not; but the producers, being informed by means of the intelligence department of the organization, will make quotations and sales more in accord with the prevailing conditions.

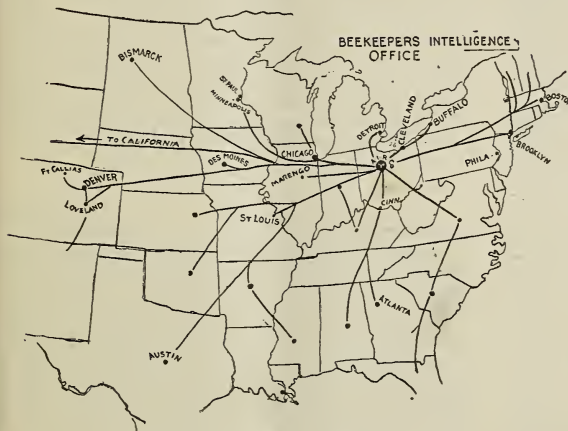
But with the completing of the intelligence machinery the work is not much more than well begun. There is need of a complete and extensive business organization. The central office need not be a warehouse, but the branch offices should be regular depots or places for handling honey, wax, and supplies. To illustrate, we will suppose the Root establishment is the head office. They, of all those connected with apicultural matters, are in a position to know of the flows, of harvests, and the moving of the crop to market. The California marketing association (have forgotten its name), "The Colorado Honey-producers' Association," and many others that are yet to be organized, each reporting to Medina office the amount of honey in sight, and kind and quality, can keep the central posted as to what is going on.

Now, the central should have a list of all honey-dealers in every city and town of importance all over the country, and these dealers could find out by applying to central where they could get the needed supply. The general manager at Medina could bring together the buyer and producer, and thus there could and would be a much more equal and intelligent distribution. Not only this, but the price would be more even and just.

There should be a branch office and depot and packing-house in every large city or distributing center. Denver, Omaha, Kansas City, St. Joseph, Chicago, St. Louis, etc., should each have a depot for handling the product of the territory tributary. There should be storage depots in every heavy producing district, and in all cases have storage rooms as near as may be to the producing field. The object is twofold at least—to save freights by enabling producers to deliver in person by wagon where it can be so done, and that there may be accumulated enough at one point to make it possible to ship in car lots.

All honey to be transported to distant markets should go in carloads, both for economy in freights and safe shipping. It is possible for wheat-speculators to gamble, buying and

selling when they do not have a bushel of wheat in their bins; but it is no way for a man to sell honey when he has not the goods where he can lay his hands on them and deliver at once. Many producers think we can agree to co-operate, then when a car of honey is contracted let each individual deliver his goods at the shipping-point, and so load a car, and no need of a wareroom. I want to point out to each and every reader why this plan can not be made a *general* success.



When you and I, brethren, make purchases we do not like to buy "out of sight and unseen." People's idea of what the goods ought to be, differ; and there is always a suspicion that, when delivery is made, there may be something wrong, the buyer not getting what he paid or bargained for. A minimum carload of honey is 30,000 pounds; and if ten or twenty producers are to deliver that much honey at a given place on a certain day of the week, almost invariably some one or more fail. It may be sickness, bad roads, bad weather, carelessness, or something; or it may be some one has had a better offer on the honey from some other source, and the high bidder gets it. All these and many more reasons I could set forth make such a scheme very untrustworthy and unsatisfactory. Such plans usually cause the early demise of the co-operative concern, and the disgust and dissatisfaction of the co-operators.

There must be storage centers, and there must be provision to supply cash to the producers when they deliver the goods. Do not forget the financial part of the matter. Cash must be on demand when goods are delivered in storage. If the plan contemplates a co-operative business, then the producer should not receive all his money *down*. Enough should be withheld so that there be no loss when the honey is marketed; but if the plan is to be an outright buying and selling, then the pay should be in full at delivery of stuff.

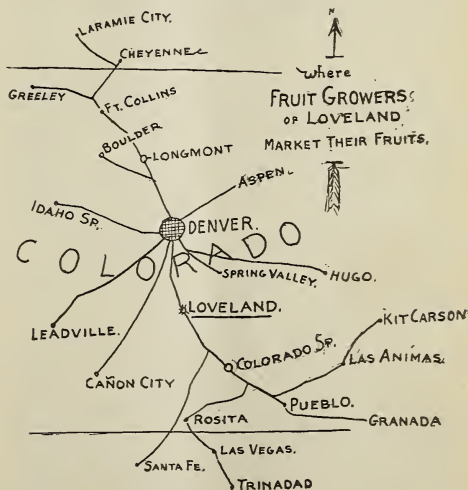
I think for several reasons the business should be neither all co-operative nor all outright buying and selling, but a combination of both methods. Some will want to sell honey outright, get cash, and be done with it at

once, and provision should be made for such. Circumstances may almost or quite compel some to sell for spot cash.

Then there are others who would prefer to put their honey in on commission. On this plan they may be able to get more money, for there is no questioning the idea that, if one buys outright, putting cash into goods, the margin must be absolutely safe, hence a less price will be paid, so that the risks may be fully covered; but on commission the producer helps carry the risks, and so of right ought to get more pay in the end. With a plan of this kind—both outright buying and commission, the business can be more mutual and also co-operative. It will bring together the greatest number of those who ought to be in the association.

One of the very first things to be accomplished is to get the producers together and co-operating. Get a general knowledge of crop prospects, and of its gathering in. Let the central office determine if the crop will probably equal the demand or otherwise, and indicate to branch offices about prices that ought to prevail. In doing this the head office should get very frequent reports of the crops, and of the kind and grade, and when it will be available to ship. Remember, it is never available for shipment until delivered in warehouse.

The head office should be fully informed of the stock in hands of the various dealers in all principal markets, and so would know about how soon any given point could use a car or two. When honey is needed or wanted, there



would be no difficulty in pointing out to buyers where it can be had, and sellers to where there is a buyer.

This looks like a big undertaking, and it is quite large, I admit; but that it will abun-

dantly pay I have no doubt. It surely ought to give us better prices, better and more equal distribution, should increase the consumption of honey, should cheapen the distribution, and, all things considered, be a benefit to both producer and consumer.

Such an undertaking as this is really the business of government (I am not bringing in any politics), and should include the distribution of all products. Management by the government would insure its being more equal and general. Some will say there would be too much jobbery; but to such I need but say that there is plenty of jobbery now in the distribution of products, and it would be hard indeed for a government distributing agency all in one concern to beat the producer out of any more than he loses now under present methods. One of the arguments in favor of combines and trusts is that one management can do the work cheaper and better than several, and the argument is good.

What is the use of two warehouses and agents where one can do all? But, why argue? It needs only a little common sense and thought to prove that government should do this work; but she does not, and we as interested producers should do it until such time as we can get government to take it off our hands.



MEASUREMENTS OF TONGUES AT THE MICHIGAN AGRICULTURAL COLLEGE.

The Direct Relation of Long Tongues to Large Yields of Honey.

BY JOHN M. RANKIN.

A short time ago two cages of bees were sent to me from J. H. Gerbracht, Spring Grove, Illinois, for measurement. Cage No. 1 was a sample from a colony that stored 240 pounds surplus, and were a strain of his own breeding. Cage No. 2 was from a five-banded strain that stored 135 pounds of surplus honey during the past season. The measurements of ten bees from each cage are as follows:

Cage No. 1.—Lengths of tongues were as follows: 6, 5.9, 6, 5.8, 6, 6, 5.9, 6, 5.8, 5.7. Average length, 5.9 millimeters.

Cage No. 2.—Lengths of tongues were as follows: 4.5, 5, 4.8, 4.7, 4.8, 5, 6, 5.5, 4.5, 4.3. Average length, 4.9 millimeters.

It will be seen that the measurements are very irregular, probably owing to the fact that the bees were of all ages, as Mr. Gerbracht says that he ran them into the cage just as they came. These colonies were on a double stand, with the entrances only a few inches apart. This will easily account for the one long tongued bee in the cage with the five-banded ones, as they doubtless worked from one hive to another to a certain extent. One experiment, of course, does not absolutely

prove any thing; but after many cases of this kind I am sure that the difference of length of tongue goes with the corresponding difference in honey production, other things being equal. The more work I do along this line the more certain I am that there is nothing in bee culture to-day that furnishes the opportunity for improvement that is offered along this line of improving the strains of our bees. I am confident that there are tons of honey going to waste every year simply because the bees have not the *ability* to gather it. As I have said before, it probably will not be practical for every bee-keeper to run an experiment station of his own, but he can well afford to pay more attention to this phase of improvement, and select his breeding stock from his best workers, even if they are not the highest-colored bees in his yard.

Agricultural College, Mich., Dec. 7.

[Yes, you are just right. It does look more than ever as if the difference in the length of tongue is in direct ratio to the corresponding yields of honey, other things being equal. But I was particularly interested in the measurements you made of the tongues of those bees that gathered 240 lbs., and the tongue-measurements we made of those *very same* bees. In GLEANINGS for December 1, page 924, the tongue measurements of Mr. Gerbracht's best workers average .19. Your average for the same bees is 5.9 millimeters, which, figured out in hundredths, is 23 plus. But you measured the entire length after it was dissected, and we measured that portion of the tongue that will stick out from the end of the mandibles. It appears, then, according to your average and our average that there is a difference of .04. Of course, you understand that this does not signify that your experiment was wrong and ours right, but that we measured from one point and you from another; yet, unless cleared up to the average reader, this is somewhat confusing. Your average tongue-length for the five-banded bees was 4.9 millimeters, which, when converted into hundredths, gives .19 plus a very small fraction; or by our own way of measuring 15 plus. That strain of five-banders, to say the least, would hardly be worth cultivating. As I have said before, the breeder evidently worked for bands, and got bands and nothing else.

Regarding the direct relation of tongue-length to yields of honey, a very interesting corroboration of this is given in Dr. Miller's Straws in this issue; but the reader will notice that the average of the measurements of A. Charton are considerably in excess of the average of the measurements of myself and even of Prof. Rankin. This goes to show that Mr. C. is measuring from another point. Surely it's high time we got together and measured from one point, all of us. But for purposes of comparison we have got enough so far to show that the increase in the yield of honey is almost in direct ratio to the increase in the length of tongue. I have been talking this up for the last six months, and it is no little satisfaction to know that my impressions along these lines have been proven by those who

have gone before me in this tongue-measuring business.—ED.]

ABOUT CLIPPING QUEENS.

A Good Record.

BY MRS. A. J. BARBER.

I have noticed in several of the bee-papers lately, items about clipping queens' wings, and how to do it. I did not suppose there were so many ways of doing it, and I was surprised that, of all the different plans described, none used mine. Perhaps many are doing so; but as none of them have told about it (perhaps thinking it too simple to need description) I will tell how I have been doing it for the last five or six years. It seems so much easier and more satisfactory than any other way that I never think of trying any other method.

When I find the queen I rest the comb on the edge of the hive and hold the upper end of it in such a way that the comb slants a little away from me. When I can get the queen near the center of the comb I start her toward the upper end of it; and by following her with my scissors I slip the blade under her wing as she runs, and take it off smooth and clean in much less time than it would take me to catch her in my fingers. One soon gets used to following her motions with the hand, and after a few trials the clipping can be done nicely without even touching the queen except with the scissors. I don't believe they know what has happened, or that any thing has happened, judging by their actions. One needs a pair of embroidery scissors, and they should be keen and sharp.

One day last spring I found and clipped 31 queens before noon.

I have had but one accident, and that was several years ago when I was nervous, and a little afraid of the bees. That time I cut both wings and legs.

I tried the pocket-knife method, but had to turn my queen loose on a comb, and clip her with the scissors after all.

I think it much easier and better to clip all the wings across straight, about half their length. As I do not sell queens, nor keep them for exhibition purposes, I like to clip them close enough to insure their being found easily when a swarm comes out. I usually have a boy watching, and it doesn't pay to leave a queen's wings long enough so that she can make any use of them or the boy will not find her.

I don't see why so many are troubled with swarms clustering before returning to the hive to look for their queen. I don't remember ever having had them do so but twice. Usually they are coming back by the time the queen is caged and the new hive put in place of the old one. Perhaps different strains of bees have different habits. When mine cluster I am always reasonably sure that they have met a young queen from some other place or hive, and treat them accordingly.

Mancos, Colo., Nov. 17.

[Your method is all right for women with a delicate touch and steady nerves. But imagine a man, who is so bungling that he can't thread a needle, trying to clip a queen's wings while free on the comb, with a pair of embroidery scissors! Why, he would probably decapitate the best queen he had. The average man, if I am any judge, would better first catch the queen and then clip.

But do I understand that you clip *both* pairs of wings for the purpose of better identification during swarming time? Of course, if you seldom pick up a queen for any purpose then it wouldn't matter much if all the wings were cropped.

But, say; your record of finding and clipping 31 queens in one forenoon is not bad. I doubt if, in the case of strong colonies, as I take it yours were, it has been surpassed.—ED.]

VALUE OF BREEDING-STOCK.

Can a Queen be Worth \$200? The Question of Inbreeding.

BY H. L. JEFFREY.

Mr. Root:—On page 848, Nov. 1, you note Moore's bees with $\frac{23}{100}$ tongue, and then you refer to the editor of the *American Bee-keeper* calling the \$200 queens an advertising scheme. Now just look at this picture, not at the bees. When Mercury, the Jersey bull, was what would be called along in years, but actually in his prime, and where his value was really known, \$75.00 was offered for his service, and why? His worth was in his ability to stamp the blood qualities. Hold your hands up in holy horror; for, 23 times out of 32, his pedigree ran back on to the cow Alpea and her bull mate. Now, then, you will (or I should say that others will) say that there is quite a difference between a queen-bee and a valuable Jersey or any other bull. Is there? Not one bit. The queen, if any thing, is the more valuable of the two. First, she is shorter lived; second, the ability to increase indefinitely the reproductive ability is more than 1000 to 1, and why? Just take off your hat, and get ready to say, "That's not so!" Well, I'll prove it, and back it by more than 20 years' test in facts.

The workers of a queen are the result of the influence of the drone she mates with. Most will say, "Not wholly so." I say positively they are, every time. For convenience admit it as a fact. Now, then, the queens from that queen are the direct and full sisters to those workers, the progeny of that queen. Those young queens being the sisters of those workers possess the same qualities as the workers, their sisters; consequently the drones of those queens possess the imparting powers of qualities possessed by the drone that was the father of the workers and queens from that first-mentioned queen; consequently the superior starting queen is just as valuable as the superior imprinting bull. From the bull we obtain the perpetuating power of his qualities; from the queen we obtain daughters to perpetuate

the imprinting qualities of the drone that she originally mated with.

This is not an uncommon illustration of the atavistic (or alternate) generation influence that is understood by a few of the most thorough investigating breeders of all kinds of stock.

Now, then, to go one step further, if you have that \$200 queen in 1901, from her raise more queens. In the most isolated place you can find, place one, two, or three of her daughters raised in 1900; from them raise drones in abundance. With those drones let the young queens mate raised in 1901; and from the earliest raised and so mated raise drones in another apiary, and mate queens raised from themselves, and from the old queen raise more queens to mate with the drones from these daughters of the \$200 queen. You will say that is too much *in-breeding*; but I shall laugh at that bugbear of the in-breeding whoop or howl. Then you raise drones from this strong in-bred stock, and let queens from worthless indigent stock mate with them, and see the results in the next three or four generations. Advise J. P. Moore and others with those \$200 daughters to raise drones from them just as early as they can, and note the results from the young queen given a chance to mate with them, and see if the drone influence doesn't tell more than 16 to 1.

But look at this: That superior queen in an apiary of 100 colonies, the hives of which her daughters preside over, give an average of 5 lbs. more honey than the general run of bees. The honey her daughters put in those 100 hives is 500 lbs., or an equivalent of \$60, at 12 cts. per lb. If an ordinary breeding queen is worth \$5.00, then that superior queen is really worth \$65.00, for the reason that she is worth just as much as her influence produces dollars and cents more than another; therefore, if your choice queen has furnished for the numerous customers only 400 queens, her actual worth is not less than \$240. If from her in 1901 you raise 1000 queens to disseminate, her actual value is to the bee-keepers not less than 10 times the \$60, or \$600. Such things are facts, and are positive; so is the natural law of 1 from 2, and 3 remains; or 8 from 2 and 10 is the result. Subtraction does multiply in the laws of nature, positively.

Woodbury, Conn., Dec. 1.

[I had always supposed that in-breeding was in all cases undesirable. I know that nature, in the case of many flowers, makes a studied attempt to avoid it. Some flowers are sterile to their own pollen. Others have the male organs only, while other specimens of the same species have the female organs only. In still other plants, while they have both the essential organs they are not both ripe at the same time. Even in the animal kingdom we find similar efforts to avoid in-breeding. If it were not for nature's abhorrence of the mixing of the same blood, drones and queens would mate in the hive instead of in the air. In the breeding of high-blooded stock there may be an exception to this rule; and if so, I

should like to get more light, especially from stock-raisers.

Mr. Jeffrey's point on why a queen may be worth \$200 is well taken. If a rooster is worth a hundred dollars, or even a thousand, why should not an extra breeding queen be valuable for a like reason?—ED.]

THE BELGIAN-HARE BUSINESS.

A Fair Statement; Extravagant Statements; Bees and Rabbits Not a Good Combination.

BY W. K. MORRISON.

There have been so many conflicting accounts of the Belgian-hare business that a word from one who has a little knowledge and practical experience in the pursuit may prove acceptable just now. The word *hare* is misleading to begin with. It is only an overgrown variety of the common domestic rabbit, such as we are all familiar with. In its native country, Belgium, it is known as the Flemish rabbit—an appropriate name.

I mention this because Prof. Van Deman, in a recent number of the *Rural New-Yorker*, said that the Belgian hare is a hare, and would not breed with the rabbit, and that the Australian rabbit is a different animal entirely. Surely Prof. Van Deman can have had no experience with rabbits; for if he will only allow his Belgian hares a good deal of freedom and scanty fare, in a short time he will have rabbits that can not be distinguished from the rabbits of Australia. And, what is more, this is how the Australian rabbits did originate, simply by the running wild of the ordinary domestic rabbit belonging to the early settlers.

It may be well to state here that the rabbit in Australia is not the pest that it is often represented to be by the newspaper press. On the contrary, a great industry has arisen in canned rabbit; and now right here in Bermuda we can buy one whole Australian rabbit, canned, for 24 cents; and, besides, the skins are in demand for felt. I saw by a recent number of Cook's *Poultry Journal* that one firm in Melbourne had sent last year to England 5,000,000 rabbits, canned or frozen, and that many of the farmers were making money in the business of raising them, so they can not be said to be a pest. I have no doubt that the Australians will make money out of the rabbit industry. Perhaps it is a better business than digging gold out of placers.

Some eight years ago I wrote an article on the subject for the *American Agriculturist*, in which I warned its readers against the amazing statements of interested parties who printed all sorts of fairy tales to induce people to buy their stock. If the warning was needed then it seems to be much more necessary now. In the long run these entrancing statements will injure the rabbit business, when more moderate statements might give rise to a good business for a number of people.

So far as my experience goes, rabbits require a great deal of care—*more so than poultry*—as each grown rabbit has to be attended to individually. They require pretty much the

same food as a cow. To get them fat, and to make them grow well, they have to be fed a little grain of some kind. To do their very best the breeding stock ought to have green feed twice a day, and a little grain once a day. The reader will thus see that rabbits require more care than chickens. Their feed does not cost quite so much, but they lay no eggs, neither is their manure valuable.

Some of the people concerned in promoting the industry make a great ado about the extraordinary fecundity of the rabbit; but this is not so important as it appears to the unobserved. A doe rabbit can just manage to produce 40 young in a year; but a hen will lay 160 eggs in a year just as easily—a proportion of four to one in favor of the hen. Both rabbits and hens breed at the same age—five months or thereabouts.

I have always understood that the Belgian-rabbit raisers were mostly market-gardeners and the like who feed their stock on weeds and refuse vegetables very largely, and I have no doubt they find it profitable in this way; but if a raiser has to buy feed for his rabbits I am afraid he would not make money at it. I suspect, also, that Americans require education in acquiring a taste for rabbit flesh.

Some time ago there was an account of the Belgian-rabbit trade in the *Journal of the British Board of Agriculture* that throws some light on the subject. It states:

The annual shipment of rabbit carcasses to England is 2,200,000, of the total value of \$1,117,000. The average weight of the Belgian rabbit is given as varying from 6 to 8 lbs., which just agrees with my own experience. Of course, they can be got much larger. For market purposes they are killed at 4 or 5 months, when the average weight is 3½ lbs. "The rabbits thus bred are kept in cages or boxes. When in cages, they are placed immediately on the ground; ashes are usually scattered on the spot covered, then a layer of loose stones is placed on the ashes, and finally the stones are covered with straw. This method keeps the cage in a sanitary condition, and is excellent for fattening rabbits for the market."

All I can add to this is amen! It agrees with my views exactly, and the rabbits I have now are kept on this plan, though I never knew that it was a Belgian plan. My experience is that pure-bred rabbits are hard to breed. I mean they have few young in a litter, and they are apt to die in the most unexpected manner, and this experience tallies with that of others.

For all practical purposes I think a cross of the lop-eared kind with the Belgians would be most profitable for market purposes. But if any of your readers are actually thinking of going in for the new business in a scientific and professional manner, I would advise them to get the best book which I believe has been printed on the subject, and which looks at it from a dollar-and-cents point of view. This is the title of the book:

"The Wild Rabbit in a New Aspect; or, Rabbit-warrens that pay. A record of recent experiments conducted on the estate of the

Right Honorable the Earl of Wharnccliffe, at Wortley Hall. By James Simpson."

The author received a gold medal for his experiments in this field. The price of the book is \$1.25, and the publishers are Wm. Blackwood & Son, Edinburgh, Scotland.

The other books that I have seen on the subject are fanciers' books, not studying the rabbit for profit. From what I know of the business I am safe in saying it will not suit beekeepers. The two pursuits of bees and rabbits would hardly dovetail, the latter requiring so much of the bee keeper's time as to keep him from his legitimate sphere—the apiary. The rabbit business is more of a craze than a business, and it will be some time before it becomes a *real* business. I incline to the view that what bee-keepers want is a greater cultivation of field crops that yield good honey in large quantity. I mean such crops as alfalfa and buckwheat. I can mention three other crops that are as great and important as the two just mentioned—sainfoin, field beans, and rape. These are great crops in every sense of the word, and by and by will occupy a large space in American farming; and it is the duty of bee-keepers and bee-papers to boom them. If the average bee-keeper would read up on these crops I am sure he will agree with me that, when these crops become the fashion, bee-keeping will yield a much more certain income than it does now. I believe the bee-papers could do much to boom these crops into popularity. They need only a little persistent booming to get them started. It is honey-flowers the American bee-keeper lacks. He should try to encourage floral crops among his neighbor farmers. Skill and bees will do the rest, and he has these now.

Warwick East, Bermuda, Nov. 7.

ARTIFICIAL BRUSHED SWARMS.

Objection to Artificial Swarming Before the Natural Swarming Impulse Comes on.

BY C. DAVENPORT.

I read Mr. Stachelhausen's article, page 840, with much interest, as I have largely practiced artificial swarming for a number of years. Our experience does not coincide in all respects; but we are a long way apart, and the difference in our locality probably accounts for much of it. As I understand it, his practice is to swarm colonies at the beginning of the main flow, if they are strong enough, without regard to whether they have started queen-cells or not. It is far from my intention to criticise any thing Mr. S. says; but here I do not consider it profitable to swarm colonies before they contract the swarming fever, no matter how strong they are, especially when running for comb honey; for with a large yard, or on a range well stocked, a good many strong colonies will not swarm naturally; and such colonies will store more surplus than they would if artificially swarmed, except, possibly, if the flow were very short, and they were hived in a shallow brood-chamber, and given supers of drawn or partly drawn comb.

Under these conditions I have secured fully as much, perhaps more, from strong colonies swarmed before they contracted the swarming fever than would have been the case without swarming; but the drawn comb formed a very important part as to the results; for a colony that has not contracted the swarming fever is not prepared to build comb, as is one that has. This is a very interesting fact that any one can verify by looking at a colony preparing to swarm, and that has cells well under way. The wax formation between the segments can be seen on a large number of the bees, which shows that they are expecting and preparing to build a large amount of comb in the near future. This wax secretion can be seen on a large number of bees in any strong colony during warm weather, whether they are preparing to swarm or not, but to a much greater extent in colonies that have preparations for swarming well under way; and when a colony which has not got its wax-works well under way, if I may use such a term, is artificially swarmed, they do less satisfactory section work here than one that has; and in quite a per cent of the colonies I have swarmed before they had the swarming fever, the queens sulked, or, for some reason, refused to lay until considerable comb below was built and filled with white honey, which should have gone into the sections. Why a queen that has just been laying profusely should, under these conditions, in some cases, refuse to begin work again in less time than one that has slacked up laying in anticipation of swarming, is something I can not understand. It would be natural to infer that it would be the other way. And, again, I have in numerous cases had the bees themselves sulk and refuse to do much work for a number of days when all the brood was taken away.

Mr. S. does not seem to attach much importance to the fact of his leaving a frame of brood; but when I have artificially swarmed colonies before they had made any preparation to swarm, I have secured much better results by leaving them permanently two frames of brood, but after a colony has once contracted the swarming fever, nothing can be relied on to cure it, barring a sudden cessation of the flow, except the removal of all the brood—that is, when the full force is kept together.

THE USE AND ABUSE OF SHALLOW BROOD-CHAMBERS IN THE PRODUCTION OF COMB HONEY.

I notice more experience is called for from those who have used shallow brood-chambers for comb honey. I commenced using these a number of years ago, and have been gradually increasing their use since; and, under certain conditions, considerably more surplus honey can be obtained with them than can be from full-depth ones; but it is done at the expense of increase and with less stores in the brood-chambers. When increase is not desired, and in a locality like mine, where the conditions are such that swarming does not naturally occur, or has to be done before the main flow commences, or is well under way, I con-

sider their use very profitable; for, as editorially stated, a swarm hived in one of these shallow brood-chambers must of necessity store most of the honey in the sections. My practice is to hive two swarms in each of these shallow hives; and the amount of section work these allied forces will do in a good flow is surprising; but during the hard work of the main flow their strength rapidly decreases, and there is not brood-chamber room enough in one of these shallow hives to allow the strength of a normal colony to be kept up. After the main flow these colonies will, as a rule, be practically without stores in the brood-chamber, and weak in bees; but the pile of filled sections accounts for the hosts that have vanished.

One of the problems with me is to keep down increase; and these shallow brood-chambers solve the matter in a most satisfactory manner, for the increase is, so to speak, turned into filled sections. Soon after the white flow I unite enough of these shallow chambers to make good strong colonies for the fall flow, if there is any. By the use of zinc the queen is, in those united, kept confined to the lower story; so when the fall flow commences, these upper stories can be removed and shaken free from bees. These colonies are then in excellent shape to do section work again through the fall flow; or I sometimes run them for extracted honey in the fall. After this last flow the bees in these hives are united with the weakest colonies in frame hives. By this means I am able to have all colonies in frame hives strong in bees for winter. In theory I do not intend to winter any colonies in these shallow hives; but if, on account of sales or winter losses, it is desired to do so, two sections are left together during the fall flow, which they are allowed to fill up for winter stores. As a rule there will be but a small amount of honey in the removed sections. What there is, is used for fall and spring feeding, and the combs are removed and rendered into wax. While the wax is no small item, when a large number of these hives are used on the plan I practice, the combs are not removed for the profit there is in the wax itself, for I have obtained much better results by using these shallow hives empty, or without combs or foundation to hive swarms in; but I have not space to explain why, for I wish to point out that, under some conditions, the use of these hives might not be as profitable as would that of full depth.

In localities where swarming naturally occurs, or can be profitably done artificially some time before the main flow commences, so that at least part of the brood-chamber room could be filled with comb and brood before the real flow commenced, probably as much if not more section work would be done by using full-depth brood-chambers, for these would allow the force of the colony to be kept up to full strength, and still not allow any more room for honey to be stored below than would be the case with shallow chambers under conditions such as they are in my locality; or if increase were desired at some expense of surplus, I would not think of using these shal-

low chambers, for, as I have explained, colonies in them are, at the end of the main flow, unless it is of unusually short duration, weak in bees, and short of stores, and the latter condition would be present if the flow were short. Of course, feeding could be done to overcome this; but one of these sections is too small to contain stores and allow a colony to build up or even hold its own. So with feeding, two sections would have to be used, which would make a full (or more than full) depth brood-chamber, and the work and expense of feeding would, I think, more than offset the extra amount of surplus that could be obtained by using one shallow section during the main flow.

Southern Minn.

[You have aroused a curiosity in me to know more about your shallow brood-chambers. What kind do you use? style of frame and the depth of it? Then you say there are other things in this connection that you would refer to but can not for lack of space. I hope you will in another article or two cover all of this ground.—E.D.]

HIVING SWARMS ON SHALLOW BROOD-CHAMBERS NOT SATISFACTORY.

BY E. F. ATWATER.

I have had some experience with the methods of producing comb honey by hiving natural and artificial swarms in contracted brood-nests, as practiced by Harry Lathrop, Danzenbaker, Stachelhausen, and others. In this locality we have a long, slow flow from sweet clover, followed by goldenrod, at no time rapid, commencing about June 1st to 13th, and lasting well into September. In such localities I am firmly convinced that the above methods do not pay. To illustrate, the past summer I hived a strong natural swarm in a single section of the Heddon hive. The frames contained foundation starters $\frac{1}{2}$ inch wide. The hive was put on the old stand. The three Ideal supers were taken from the parent colony and placed on the swarm. Work in the supers went on for about two weeks. By that time the colony was so weakened by loss of old bees that super work was almost entirely discontinued. A little over half as much comb honey was taken from this colony as from colonies of like strength that did not swarm. Had the swarm been hived on full sheets of foundation, the results might have been much better, as enough bees would have been reared to gather the late summer and fall crops.

About June 15, 1889, I shook two colonies having cells built for swarming. Each colony was given a frame of unsealed brood, according to Danzenbaker's method. Supers were taken from the old hives, and put on the new swarms. Both colonies swarmed out about 10 A. M. the next day. The swarms were returned. One colony settled down to work, completing about 40 sections. The other loafed during the best part of the season, completing about 30 sections. Now compare these yields with the average from that yard, of over 60 lbs. per colony.

A strong colony having made no preparations for swarming was shaken on starters, and given a frame of drone brood. They gave less than 40 completed sections in a yard where the average was 60 lbs.

Swarms hived on starters in a single Heddon brood-nest, or in a Langstroth hive contracted to five or six frames, have invariably stored pollen in the sections, regardless of the use of a honey-board. Despite the arguments of S. A. Deacon in the *American Bee Journal*, and others, I know that I secure far better results in comb honey by hiving natural or artificial swarms on full sheets of foundation, because, as I have said before, I have a honey-flow lasting from 8 to 10 or even 12 weeks; and, furthermore, pollen in the sections is the greatest objection to the use of a very shallow hive.

I have had little opportunity for experiment during the past season, as less than three per cent of the colonies swarmed. You say, Mr. Editor, that "tending the bees on starters has decidedly a tendency to check swarming;" but I have shown that sometimes it serves to hasten swarming, apparently making the bees the more determined to swarm.

Yankton, S. D., Nov. 24.

[Your conditions, friend Atwater, are perhaps a little peculiar. In your first paragraph you speak of having hived a swarm in a single section of the Heddon hive on half-inch starters, and then placed thereon three Ideal supers. You say the work in the supers went on for two weeks, and about that time the colony was so weakened by the loss of old bees that the super work was almost entirely discontinued. A little lower down you speak of preferring to hive on full sheets of foundation in a contracted brood-nest. Now, I fail to see how, if you had done this in the case under consideration, the swarm would have been any better off. You say that in about two weeks' time the colony was weakened by the loss of old bees. Even if you had hived the swarm on full sheets of foundation it would have taken a month, at the least calculation, to have gotten a force of field bees, so that your remedy would not have helped the matter at all. If, however, the colony had not swarmed, and they could have had the new blood, or, rather, a new force of field bees from the brood in the parent colony, then I can see how work might have continued in that super.

In your locality I should say it was an advantage not to have any swarming. While that is true of any locality to a great extent, yet it seems to be particularly so for yours. The only argument, then, it seems to me, that you advance against shallow brood-chambers is in the pollen going up into the sections. We have had a great many reports of this with brood-chambers as shallow as the Heddon; but only two, so far, I believe, were brood-chambers 7 inches deep. I am not advocating shallow hives; but we must be sure not to let one swallow make a summer, or base our conclusion on the work of three or four colonies.

I still think that hiving on starters has a tendency to discourage swarming. Any swarm,

when newly hived, is liable to swarm out again, no matter what the conditions. But if we can make them once stick for a day or two, we can hold them.—ED]

WINTERING BEES IN THE SOUTH.

BY J. W. JACKSON.

Some time ago some one from the South asked GLEANINGS why it did not tell how to winter bees in the South. The substance of the reply, as well as I recollect, was that the same conditions did not apply; in other words, that the winters are so mild in the South that there is no such thing as wintering.

Wintering here is not of such moment as it is at the North, but still it should have some attention. Opelousas is only $6\frac{1}{2}$ or 7 degrees north of the Tropic of Cancer; but it gets very cold here sometimes in the winter, comparatively. The thermometer may drop in a day from 75° or 80° to 25° Fahr., and then the bees, small colonies especially, when left as they were in the summer, suffer from the cold. After a cold night of a cold "snap" I have seen apparently a quart of dead bees lying at the entrance of an upright triangular hive. Wintering here, then, would consist in protecting the bees against these sudden and extreme changes of the weather.

Winter before last—the coldest one on record—the thermometer went down to 5° or 6° Fahr.; ice floated past New Orleans for the first time in a hundred years. Of course, many unprotected or insufficiently protected bees were destroyed. During the winter of 1888 there was no ice at all, and no frost (hoar frost) after November. Corn planted in February came up in five days. China-trees, usually in full bloom about the 10th of April, were in full bloom then the first of March; on the 3d of March there was a freeze that caught the advanced vegetation, killed the young corn, and killed the limbs of many China and even peach trees, to the body of the tree. Bees necessarily suffered.

Bees, then, should have some protection in winter. I use the gable-end cover on my hives, for summer ventilation. About the last of October I put oilcloth on the tops of the frames, to protect the bees against the cold air of the nights and cloudy days passing through the cover; I also reversed the bottom-board (Danzonbaker) so as to have the $\frac{3}{8}$ -inch side up and the $\frac{7}{8}$ -inch side down, and contracted the entrance according to the strength of the colony. The weakest colonies I reduced in space with division-boards. So far this has been all that was necessary. But I have ready, for the cold snaps that may come, an oilcloth sack or box for each hive, to protect its inmates during the existence of the snap—sometimes a day or several days, a week, and possibly longer. I use the ten-frame Langstroth hive, and I find that oilcloth 46 inches wide is very good in size. I cut a strip off 23 inches wide. It is then 46 inches long. It runs lengthwise of the hive, making top and ends of the sack or box. I mark it so the top is 23 inches, and the ends each $11\frac{1}{2}$ inches. Then

I cut another strip $11\frac{1}{2}$ inches wide, and divide it in the middle. Each piece is $11\frac{1}{2} \times 23$, and makes the sides, the ends of the top piece uniting with the ends of the side pieces. The sewing can be quickly done on a machine. When a cold snap comes I propose to drop or place a sack over each hive while it lasts.

This year I have some bees, gotten late in the season, that have not two sets of combs. Others have two sets, and were working in the upper story. One had even three boxes. With these I put the upper story on the bottom-board, laid on it a honey-board, and put the brood-chamber on top. I think they will winter better in that condition.

On Saturday, Dec. 1, the weather was so mild that I saw many bees out after sundown. Opelousas, La.

CUBA.

A few Plain Facts for Those who Think of Going There.

BY THE AMERICAN TRAMP.

It is quite a while since I had the pleasure of writing to GLEANINGS; but after reading Mr. Osburn's article on page 915 I should like to give my view of conditions here, and ask him for some information.

I think a man with a little money had better stay out of Cuba, no matter how much push and perseverance he has. A good doctor or dentist who has a good paying practice here, or some one holding a government or other good paying job, if his personal habits are not too extravagant, can afford to go into bee-keeping here.

Mr. Osburn says the price of every thing is high. I think this should read, "The price of every thing we buy is high, and what we have to sell is worth nothing."

Let us take honey. The price of the best honey at the present writing is 40 cents per gallon, Spanish gold. This is equal to 36 cents American. It costs the bee-keepers here, on an average, \$3 00 for freight and cartage on the empty and full hogshead of honey (100 gallons). This brings the price down to 33 cents per gallon, or $2\frac{3}{4}$ cents per pound. Now, the cost of living here is more than double what it is in the United States; so, compared with the bee-keepers of America, as we have to live by our product, we are getting the very high price of $1\frac{3}{8}$ cents per pound for honey.

In the same issue of GLEANINGS I see Mr. Aikin criticised for selling his honey for 6 cents. He'd better sell out up there and come to Cuba, where he can get the very high price of $1\frac{3}{8}$ cents per pound, taking the price of living here into consideration.

I have not overdrawn this, as there are plenty of every-day staples that we have to pay not only double for, but four times as much as they cost in the United States. If Mr. Osburn calls 3 cents a pound a high price for honey, will he in his next article please rise and tell us what he would call a low price?

Artemisa, Cuba.

THE PERSONNEL OF THE UTTER TRIAL.

BY E. R. ROOT.

As promised in our last issue, I take pleasure in introducing to you some of those who took a conspicuous part in the celebrated case of Utter v. Utter at Goshen, N. Y., a case that involved new principles in law; and has, since the trial, been heralded, on account of its novelty, over the entire United States.



HENRY BACON, THE ATTORNEY WHO MADE THE PLEA BEFORE THE JURY.

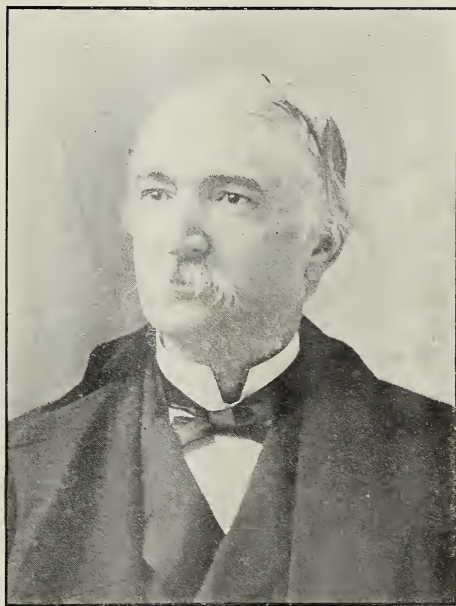
The National Bee-keepers' Association, together with Mr. Utter, employed as attorneys the firm of Bacon & Merritt, of Goshen.



JOSEPH MERRITT, ONE OF THE ATTORNEYS IN THE DEFENSE.

This firm has been engaged in active practice for sixteen years, and I was told by numerous residents that they were the best lawyers in the county, and that we had made no mistake in having them to defend bee-keepers and their interests. They had been retained in some important railroad cases; and very recently had won in a celebrated drainage case involving something like \$15,000.

The next personage to whom I introduce you is Judge John J. Beattie, of Warwick, N. Y., who presided at the Utter trial. As already stated, he was as fair a judge as ever sat on the bench. If he had any prejudice or leaning for one side or the other it could not be discovered. He has held his position for two terms, and is now on his third term. Of him it is said that the evil-doers of the county hold him in wholesome fear; that he has always tempered his decisions with justice and mercy. He is a man of large physique, of commanding presence, a kindly, benevolent face, and every inch a judge.



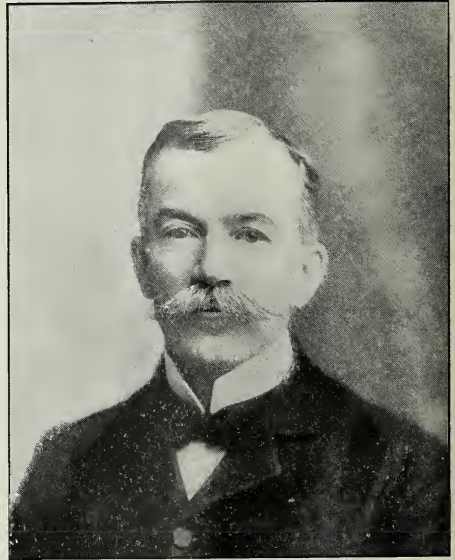
JOHN J. BEATTIE, THE JUDGE WHO PRESIDED.

The defendant, Mr. J. W. Utter, has been engaged in keeping bees and raising fruit for a good many years. Unfortunately, there has been a difficulty between him and his brother, Mr. W. H. Utter, the plaintiff, over the settlement of their mother's estate; and during the years that have since elapsed there has been more or less trouble between them, culminating in this celebrated suit with which our readers are now so familiar. From all the evidence that I heard in the court, and from what I could hear from local residents, it appeared that Peach Utter had it "in" for his brother, and continued to annoy him on every occasion.

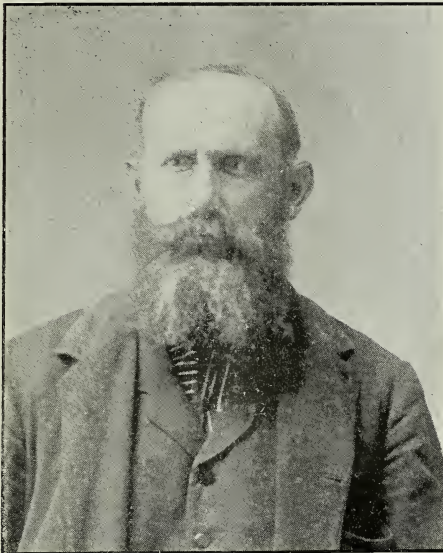
What appeared to be a family feud resulted finally in bringing out a test case—a case that, in the language of the lawyers, had up to that time never been adjudicated, and therefore involved the introduction of new principles.

But the star witness in the case, on the side of the bees, at least, was acknowledged by all to be Prof. Frank Benton, Assistant Entomologist of the Department of Agriculture, Washington. Probably no other bee-keeper in the world has had so wide and diversified an experience in different climates, in different countries, and with different species and races of bees, as Frank Benton. His earliest experience with bees began in Michigan, where he was born and reared. We next hear of him as a student at the Agricultural College, at Lansing, Mich. He was known as a close, careful student, and an accomplished linguist. These qualifications especially fitted him for the trip with D. A. Jones in 1879 and '80 through the Orient, for new races of bees; and as a result, Cyprian, Syrian, and Palestine bees were introduced in the United States and Canada. Later on, Mr. Benton made tours to India alone, after the celebrated *Apis dorsata*, captured them, if I mistake not, but was not successful in getting them alive to the United States. Subsequently we find him in Germany managing a series of out-apiaries a thousand miles or more apart. About this time he was engaged in sending queens of the various races to the United States, prominent

I am correct, they were not bees worth propagating as compared with other races. A few years ago he came back to his native land,



PROF. FRANK BENTON, THE STAR WITNESS.



J. W. UTTER, THE DEFENDANT.

among which were those of the Carniolan race.

At some time in his career, I do not know just when, he made his way down into the northern part of Africa, studied the Tunisian bees in their native habitat, but concluded, if

finally entering the service of this government.

As a witness in this celebrated case of Utter v. Utter he gave incontrovertible evidence; and while the attorneys for the plaintiff made vigorous attempts to break down the testimony of many of the other witnesses on the defense, when they came to Prof. Benton they very wisely concluded that they had run up against one who could neither be scared nor shaken.

During the last few weeks there have been numerous clippings from agricultural and daily papers sent us, concerning the Utter trial. The case was so new, involving as it did so many new principles, that it gave the reporters free scope with the pen. It would make "mighty interesting reading" if we could publish all the various accounts, but space forbids. I can not, however, pass by one in rhyme that has been going the rounds of the press. Leaving out entirely supplementary matter in prose, the account in stanzas reads as follows:

"Peach Tree" Utter took no ease
When he learned his brother's bees
Ate the peaches on his trees,
And caused them all to rot.
"By," says he, "the Holy Grail
I'll git upon the critters' trail
An' kitch a couple by the tail."
But, b'gosh, their tails were hot.

Further yet than eye could see,
Daily o'er the verdant lea
Flew the busy little bee,
Humming merrily its song.
"Peach Tree" then experimented
Till he had a cage invented,
When his nature stern relented,
And he chuckled, loud and long.

Jeffry Utter and his fellows
 Claim the peaches all had "yellows,"
 E'en though William loudly bellows
 That, b'gosh, it warn't so.
 And all the country roundabout
 Is twixt a "holler and a shout,"
 While they're waitin' to find out,
 'Cause they're anxious fur to know.

Our Honey-Bottling Symposium.

How to Wash the Bottles; Filling with Hot Honey or Cold; Bottles with Corks or Self-sealing Tops; Temperature of the Honey to be Bottled.

BY G. A. DEADMAN.

There are comparatively few bee-keepers who know much about bottling honey; at least it is so in "this locality." It pays, not only from the standpoint of advance in price, but also in increased demand for our product.

honey was in them, so we now do this before filling, and when still moist from the washing. It is for this reason we do not let them dry in the sun, but as soon as washed place them inside or in a shady place.

Before washing, a boy examines and removes any scales of glass that may be adhering to them. He does this with a screw-driver or some such thing, and hands them to the party who does the washing. Some bottles do not require this, but others do, and especially the 1-lb. jelly-bottles, which we prefer to all others. I have given my order in advance, specifying particularly that they be free from these scales; but occasionally we find them, and I feel safer to go over them all before washing. I say *before washing*, for they are much more difficult to remove when wet. I know some pay no attention to these; but I do not like the thought of the possibility of any one getting a piece in the mouth or throat, as the consequences may be serious.



WASHING AND CLEANING THE BOTTLES.

It is not so difficult as some may imagine, nor so slow as many might suppose. The first thing is to have your bottles all cleaned and ready, and the best time to do this is the day before filling. Not only are they less in the way, but in better condition for wiping before labeling.

Formerly we would wipe them after being filled, just before wrapping them, previous to packing them. We found, however, that they were then much harder to polish after the hot

In washing, it is easier and better to use plenty of water, and three pails are preferable to two. It is for this reason we prefer doing this work near a well. It is an easy matter for two persons to examine and clean six gross or more in a day, which is as many as you will fill in the same time.

Next in order is the filling. We always warm the honey before doing this. To keep it from granulating is not the only reason. It would be too slow work otherwise. The tem-

perature we prefer is 170° F., and we never want it more than 180°, believing that, if much hotter than this, the flavor is injured; and if allowed to come near the boiling point the honey is darkened as well. The round all-glass dairy thermometer is best for this purpose. We suspend it by a string from the top of the can so it is always ready for examination.

The question is now, when and how shall we heat the honey? The kitchen stove will do, but we do not recommend doing it there. As we bottle all our honey in the back shop of our drugstore, we prefer warming it outside, and as near the back door as we can get, until this year, when we used a sugar-kettle having sufficient water in to surround the honey nicely. The objection is, a waste of fuel, and the annoyance from smoke. Not long ago some

ble stove we can warm the honey as fast as we can fill 1-lb. bottles or smaller. As it takes about an hour to get the first lot ready by starting at 7 o'clock, the honey will be ready by 8. We can then take off 40 lbs. every half-hour, which means one hour for this quantity when using two tins. This would be from 700 to 800 1-lb. bottles in a day. If the honey is granulated it is absolutely necessary to stand it in water; and then two boilers on a cook-stove would be better. You do not require to use water if the honey is sufficiently liquid to pour. Though honey is strained as it comes from the extractor, we do this again through thin cheese-cloth on the can we fill from. Keep the honey on the stove covered also, if for no other reason than to preserve the aroma. When filling 1-lb. bottles we take the tare of each, using a double-beam scale



MR. DEADMAN AND BOYS BOTTLING HONEY.

one (unlike those we read about who live in Muskoka) walked off with our kettle; and when looking for it, or something to take its place, I found on a heap of old iron the readily movable stove seen in the picture. I have been glad more than once that my kettle was stolen, as this stove is so much better. It is nothing more than the oven part of an old-fashioned cook-stove. There are no legs and no bottom, so we set it on the ground and move it where we please. Two lots of honey are warmed at one time; and as the pipe is at the back, and not, as with box stoves, at the end, it warms with equal rapidity. This is an advantage in itself. With this readily mov-

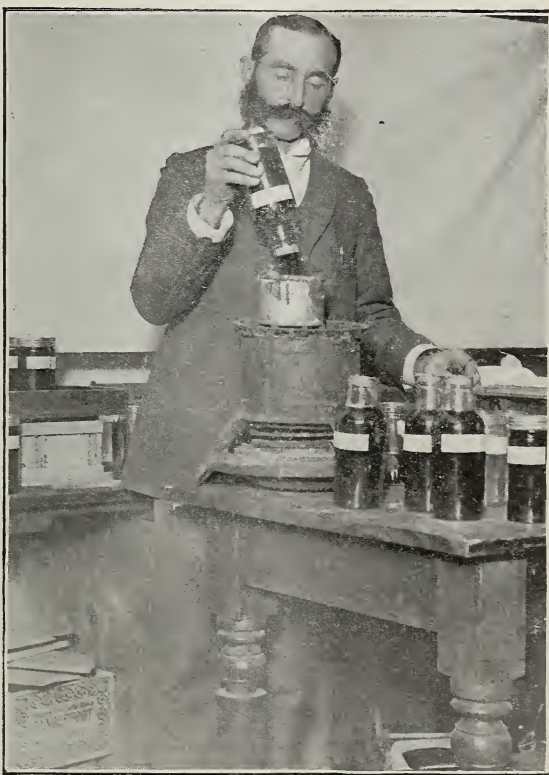
able stove we can warm the honey as fast as we can fill 1-lb. bottles or smaller. As it takes about an hour to get the first lot ready by starting at 7 o'clock, the honey will be ready by 8. We can then take off 40 lbs. every half-hour, which means one hour for this quantity when using two tins. This would be from 700 to 800 1-lb. bottles in a day. If the honey is granulated it is absolutely necessary to stand it in water; and then two boilers on a cook-stove would be better. You do not require to use water if the honey is sufficiently liquid to pour. Though honey is strained as it comes from the extractor, we do this again through thin cheese-cloth on the can we fill from. Keep the honey on the stove covered also, if for no other reason than to preserve the aroma. When filling 1-lb. bottles we take the tare of each, using a double-beam scale

now use very few of the former. We usually fill the quart when getting behind with the 1-lb., as it would require two or three stoves to warm the honey fast enough to keep one filling them. The bottles to be filled are piled up behind the one who does the wiping and labeling. They are then handed to the one who does the filling, who, in turn, gives them to the person who covers and puts them away. If a child is to do the labeling it is best to have the bottles wiped beforehand. They will then be encouraged by easily keeping ahead. If short of help, label also beforehand, but it makes less handling when all is done at the same time. We always use gummed labels, and we moisten the gum by placing them in a folded cloth kept wet. This is better than doing it with the tongue. We think the label looks better when placed about half way between the center and top. Never put it across the center of a bottle. We prefer a label going across rather than one up and down, believing the former shows the honey off better. Have "Pure Honey" in clear bold type; next the directions small, and then the name and address in clear type below. Many labels in use have directions about the honey granulating, etc., and read, "This honey *will* granulate." Now, as we do not expect our bottled honey to do this, but at the same time wish to educate and provide against a possible chance of its doing so, we say on the label, "*Should* this honey granulate it can be liquefied by placing the bottle in a warm oven or in the reservoir of the stove." The tin covers for the 1 lb. bottles have a cardboard inside. We have never known the honey to leak unless the bottle was faulty. We are careful, however, not to allow the hot honey to touch the cover, and therefore do not roll them in paper until next day, when they are placed away ready for packing.

As a customer will invariably prefer a bottle with a cover rather than one with a cork, and as they can be bought so cheaply, we see no reason for using the latter. Should you wish to do so I would soak the corks for a few hours before using, unless you wish to seal while hot. Soaking them not only gathers up any cork dust found in the crevices of large corks, but makes them fit much better. They must be allowed to dry before sealing, should you wish to do this. We prefer pure beeswax for this purpose. Have it kept hot, and invert the bottle, holding it perpendicularly when placing in the wax. You may require to dip the second time. Before sealing, cut

off any projecting cork with a sharp thin-bladed knife. If you wet the corks first they easily pound in level, using a wooden mallet.

If you wish something cheaper than beeswax, then combine equal parts of resin with about one-fifth tallow. A little vermilion will improve the color. If I were using corked bottles I would have a label with my address, etc., made especially for the purpose, and stick it on; but so long as the public prefer, and I can buy 1-lb. bottles, such as I have described, and have a profit on them at four cents each, I shall never bother with those requiring corks. There are other sizes of the same make; but as the smaller sizes cost near-



SEALING THE BOTTLES.

ly as much I prefer the 1-lb., and always the "straight." There is another make that's shorter, a little larger at the bottom than at the top, and that have a projection near the top. They not only do not look as well, but are more difficult to pack so as to keep from breaking. The straight ones ship well, and are easy to pack, having had only one broken out of 5000 shipped one season.

We use only warm water for washing the bottles when it is too cold to be comfortable without. On a hot day the cold water is preferred, but on a cold day the warm is better. Never wash them in the house unless you are

obliged to. Only the water that is used for the first rinsing is changed, as it, of course, needs changing most. The one that was used for the second rinsing now takes first place, and the one for the final rinsing the second place, so that we always have the clean water for the last rinsing. With the "readily movable" stove it will warm as fast as required.

As to wiping the bottles, this is done only on the outside. After standing for an hour or so to drain over night, the hot honey will attend to the inside. In wiping, all that is necessary is to hold the bottle in one hand, then with the other hand and a soft towel encircle as much of the bottle as you can, and go from

The latter is preferable. When folding in the ends, always begin where the paper ends.

They are now not only ready for delivery or shipment, but if there is any leakage the paper will show it. Before doing this we go over the covers and see that all are reasonably tight. If those with cardboard covers have been properly put on they will not require tightening — not so, however, with the fruit-jars. I think having all this done at one time is better than having to give them a "bath" before being able to fill an order, and they will look just as "fresh and clean" after three months as they do the day they are wrapped. I have had occasion to liquefy

some that had granulated in the bottle, but I never do it from choice. Unless one had extensive appliances for heating, it would be altogether too slow. Then one can only guess at the temperature; and the filling is not only slower, but it is impossible to be as accurate.

I decidedly object to handling hot bottles, whether for cleaning or labeling. They get warm, it is true, when bottling the honey hot; but it is not until they are placed away after covering.

We prefer, when warming the honey, to have one more tin than the number on the stove, so as to have one ready to put on immediately when one is taken off. We prefer to have about 40 lbs. in each, except when beginning, when we have about half as much in one, till we get a start. Any tins will do for this purpose. Ours are round, holding fully 50 lbs.; have handles to lift off with, and are made of heavy tin. The 60-lbs., same as you store your honey in, will do, but I prefer the top all open.

I omitted to mention that, when filling without weighing, you should have your bottles a little fuller than you wish them when cold, as the honey occupies more space when hot.

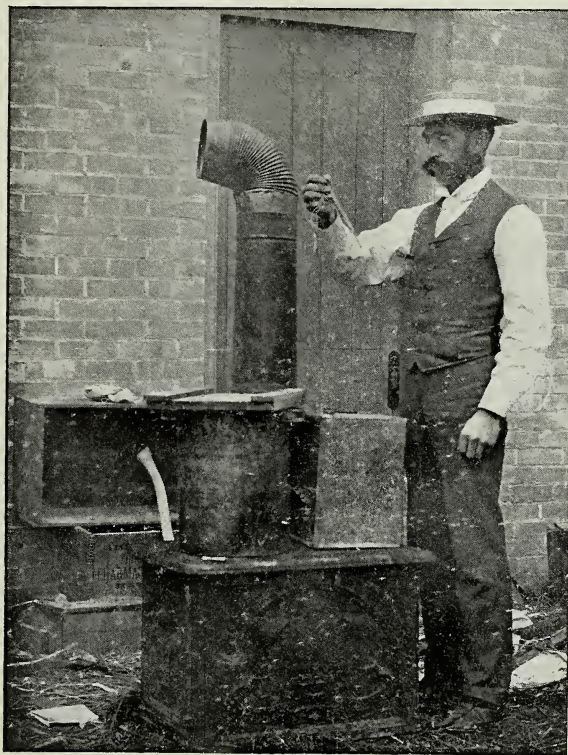
Brussels, Ont., Can.

BOTTLING HONEY.

The Right Kind of Honey for the Purpose; Mixing
Honeys to Secure a Flavor; Why Honey
Should be Heated in the Bottles.

BY EARL C. WALKER.

Before proceeding to describe the various steps in the process of bottling honey, allow me, Mr. Editor, to say a few words concerning the honey which is to be bottled; for, aft-



TAKING THE TEMPERATURE.

top to bottom, then turn the bottle around and do the other side the same way. This is all that is required. When filling, have a towel and water handy so that only clean hands touch the bottles. They will then not require any more wiping. The papers we use for wrapping are old newspapers, which can be had from newsdealers for two or three cents per pound. A thin-bladed honey-knife is the best for cutting to desired size. Wrap as soon as cold, and before any dust can gather on them. There are two ways of doing this. One is by folding as you would a parcel, and the other by rolling the bottle in the paper.

er all, more depends upon the grade and quality of the honey than upon the manner in which it is put up.

Bottled honey is, as a rule, purchased by a class of customers who demand a fancy article, and are able and willing to pay a fancy price for it. This being true, only a first-class article should be bottled. A great majority of the people who eat this bottled honey never see the package or jar in which it was bought. The cook empties the honey, and sends it to the table; if it is good, and tickles the palates of those who eat it, they demand more of the same kind; but if it is an inferior article, with a rank flavor, they want no more of this or any other kind, for they either decide that they don't *like* honey, or that it is impossible to obtain a good or pure article.

But not only should the honey, to be bottled, be of fine flavor, but it should be light in color. Dark honey looks bad in glass, and is a drag on the market. Recently I tried to sell some bottled honey to a fancy grocer. He said no; he wanted none, for it would not sell. "Why," said he, "I have honey in just such jars as those, which I have had on hand for years." I asked to see some of the honey he referred to, and was shown several jars of very dark honey on which were the labels of Chas. F. Muth. They were out on the counter, too, in plain view, but no one wanted to buy such honey.

Now, if *dark* honey, put up by a man with such a great and good reputation, would not sell in *jars*, how can any of *us* hope to dispose of cheap goods in fancy jars, and at fancy prices? This grocer would not buy any of my fancy honey, but agreed to take two dozen jars on trial, with the understanding that I would take them back if he could not sell them. In less than two weeks he ordered more, and he is still a customer.

Now as to mixing the different varieties of honey to secure a standard flavor. I know many practice this, but I think it is a poor practice. Why not label the different kinds and flavors, and thus educate the public taste? The sooner the public learns that there are different kinds and flavors of honey, the better. Many people who are fond of *clover* honey can not bear the taste of basswood or poplar, or *vice versa*; nor can they stand a mixture of them. There is no more excuse for mixing the different kinds of honey than there would be for mixing all the different kinds of jelly to get a standard flavor. Better label each *kind*, and let the customer choose that which he likes best. This is no theory with me, but it has been demonstrated by experience in bottling and selling honey.

A gilt-edged article of extracted honey should be put up in a neat and attractive package. I have used mostly the Powder and Muth jars, but I am now trying a new kind, a self-sealing jam-jar with a glass lid and rubber ring, which saves the trouble of waxing corks.

But, regardless of what kind of jar is used, the process of bottling is practically the same. The first thing to be done is to thoroughly wash the jars and remove the fine glass splinters or slivers which are so often found pro-

jecting from the interior surface of the same. The jars are then drained and dried. They are then ready to be filled with honey.

The jars are filled from a large tin tank filter with a good-sized honey gate. If the weather is cold, and the honey is thick and stiff, it should be warmed before being placed in the large tank, for it will then flow rapidly from the honey-gate into the jars, and save a great deal of time.

When the honey is being poured from the cans into the tank, and when it is being drawn from the tank into the jars, it becomes mixed with air, and filled with bubbles. If you doubt this, take one of the jars you have just filled and hold it up to the light. You will see that the honey is filled with hundreds of little beads (or bubbles) of air. Now, it is this air in the honey which helps it to granulate. You may seal it up as tight as you please; and if these air-bubbles are left in, it will *candy* as soon as it is exposed to cold. To drive out all of these air-beads I place the jars in large tin trays of water, which are heated to 175° or 180°. Any greater degree of heat will injure the flavor of the honey, and tend to *darken* it.

The trays used are made of galvanized iron, and are about 5 inches deep, and large enough to hold conveniently about 40 jars. A gasoline-burner keeps the water at the right temperature.

After the honey is thoroughly heated, and all the air is expelled, the jars should be sealed at once, before being allowed to cool. The corks are sunken slightly below the top edges of the jars, and then covered with melted wax. In this way they are hermetically sealed, and will all be sold before they will granulate. I have kept clover honey, sealed in this way, two years, and there were no signs of candy-ing. When the corks were drawn, the air could be heard hissing in, thus proving that, when the jars cooled, a vacuum was produced.

The above, Mr. Editor, will answer your question as to the reason for heating the honey *after* it has been placed in the jars. This is a little "wrinkle," but an important one.

If self-sealing jars, mentioned in the beginning of this article, are used, no waxing of corks is needed, as the rubber ring and glass lid make an air-tight seal.

If the regular honey-jars with corks are used, a tinfoil cap adds greatly to their attractiveness. The method for putting these on is so simple that it need hardly be described. The method that Chas. F. Muth used, as described by him in his catalog of years ago, is as good as any.

The last thing of all to be done is to put on the labels. I use a dark-blue label printed in gold. The dark label is not as easily soiled as a light-colored one; and then by contrast the honey looks lighter in color with the dark labels.

An attractive label is a great help in selling the honey, and then it is an advertisement for the producer.

I use dextrine to stick the labels on the jars; and by spreading it over both surfaces of the labels they will never curl up or come off.

The bottling of honey is an important subject, and I am anxious to read your symposium, and learn how others do it.

New Albany, Ind., Dec. 14.

BOTTLING HONEY.

Size and Construction of Vats for Heating the Bottles of Honey; Tumblers vs. Jars or Bottles.

BY WALTER S. POWDER.

Bottling honey, with me, is done according to the time we have to devote to the work, making a sort of fill-in job of it. For instance, we wash a batch of jars one day, and fill and cork them at another time, and so forth, although we try to get a good stock ready in the fall before granulation starts. In washing jars we use a vat containing five gallons of clean water. Take one jar at a time, and with the jar half full of water shake and then rinse the outside of the jar. We now invert them till well drained, and then place them right side up and allow them to stand till dry. In heating the filled jars we use a two-burner gas-stove which stands eight inches above the floor. We like the low-down stove because it is very convenient in lifting off sixty-pound cans of honey or heavy pails of beeswax.

For heating jars we use vats made of galvanized iron, 11×18½ and 5½ deep. Heavy handles are riveted at each end, and we find this a very convenient size to handle. In the bottom we place thin boards with narrow cleats secured to the under side to prevent the jars from touching the metal. As many of these vats can be used as business may require. They hold 28 one-pound jars, 40 eight ounce jars, or 54 five-ounce jars. On a two-burner gas-stove we use two vats at a time. If we wish to melt honey in five-gallon cans we use a vat covering two burners, and melt two cans at once. If we used Mason jars or tumblers we would then have vats made especially for them. If we did not use gas for fuel we would then use a gasoline-stove, because we must have a fire that can be easily regulated.

I have no doubt that a tumbler is a very desirable receptacle for honey in Mr. Fowls' locality; and the fact that a tumbler is still a useful article after its contents have been used is worth considering; but I have often wondered if the consumer takes this into consideration. I abandoned the tumbler because I learned that I was competing with a tumbler exactly like one I was using, and containing a thin slice of comb honey and a whole lot of glucose mixture. The jars are not convenient for such adulterated goods, and to my knowledge I have never seen them used for any but pure honey.

We cork all jars immediately after filling and before heating. I prefer the cork to fit easily; but if they are properly steamed, quite a large cork can be inserted in a small-mouthed jar by hand. On one-pound jars I use a label covering one side of the jar and a foil cap over the cork. This side label consists of

a guarantee of purity, and directions how to liquefy in case the contents should granulate. On the smaller jars we use a round gummed label over the cork and a slender label around the neck.

Indianapolis, Ind., Jan. 9.

[It has been our practice to pour the honey into the jars when cold, and then heat the jars with the honey in the vats of water, of the kind described by Walter S. Powder. After looking over the various methods this seemed the more practicable for our conditions and circumstances; and now it would appear that it is *altogether the best method* in that it may (I don't know positively) preserve the honey in a liquid condition longer than when the honey is poured into the jars while hot. I had never thought of it before; but if jars are filled with either cold or even hot honey, and coked, innumerable small bubbles of air would be scattered, I should suppose, all through the honey. Whether this is true or not, these would necessarily disappear if the honey were *heated gradually, and then coked*. I had not thought of it before, that air in honey will hasten granulation; but our own experience leads me to believe that the theory of Mr. Walker is correct. We have taken some of the honey that we bottled during the past fall, placed it outdoors in the cold air, to be subject to all sorts of variation, from 70 degrees down to zero, or nearly so, and yet it has remained clear. Mr. Fowls, in his article on bottling honey, described how he heated the honey in the first place, poured it into the jars hot, and then sealed. In one of his previous articles he tells how he goes around and gathers up all the jars in the local groceries where the honey is candied, takes the bottles that are cloudy, and gives them, in exchange, bottles of clear honey. Now, I don't know, but it strikes me if he were following the plan that Mr. Powder, Mr. Walker, and ourselves use he would not have to go into this kind of exchange business.

Mr. C. H. W. Weber, of Cincinnati, who has been doing a large business in bottling, and who bought out C. F. Muth & Son, told me of a valuable little kink, and that is, in the method of inserting corks. The jars are filled, and then the corks are laid loosely on top of the bottles, or just barely entered, we will say. After half a gross of the bottles are so prepared he goes around with a mallet having a rubber face, and drives these corks clear down into the mouth of the bottle. One or two blows force the corks clear down; and it is done so quickly that it leaves all other methods of forcing corks down clear in the shade. Some insert them by means of the weight of the body on the hand. Others use a lever. But this wastes time as well as requiring a great deal of strength.

Mr. Weber did not tell us where he got his mallets with rubber noses; but here is a suggestion: Take a common wooden mallet and put on each of its faces one of these new-fashioned rubber heels, such as you can buy at any shoestore for a few cents. These rubber heels are about half an inch thick, and are secured

to the shoe by means of three or four nails whose heads are countersunk into the rubber.

In all the articles, reference is made to the use of beeswax for smearing over the corks to make a hermetic sealing; but we have found, and our experience seems to be that of a number of others, that a mixture of paraffine, beeswax, and resin, equal parts, makes a much better sealing than pure beeswax. The mixture will spread evenly over the cork, without cracking or leaving air-bubbles, while the wax alone is liable to do both.

Mr. Pouders and Mr. Walker's method of bottling is almost exactly the same as the one we use here at the Home of the Honey-bees, with this difference, that we use steam, which is much more convenient.

I wish to indorse particularly, one of the points made by all three of the writers in this symposium; and that is, the importance of getting all the particles of glass off that cling to the inside of the bottles.—ED]



AN ADJUSTABLE SURPLUS ARRANGEMENT.

Returning home from the postoffice last night I found Mr. Smith and Mrs. D. in the sitting-room awaiting my return. Upon passing the usual salutations, and remarking about the nice winter weather, Mr. Smith launches out thus:

"A friend of mine, who keeps bees, told me to-day that you had a surplus arrangement for comb honey that you could enlarge or contract at will to suit the size of the colony or the season of the year, and I have come over to have a little talk with you about it—that is, if you have no patent on it, and feel free to tell me about it."

"Relative to your last point, I never even thought of getting a patent on any thing I ever made or planned. And as to telling any one about the things I use, and how I use them, it is something I have been at for the past thirty years, and it always gives me pleasure if I can help any one in any way."

"Thank you. And now how is that surplus arrangement made?"

"All that is necessary is to make the wide frames, which hold the sections, so they will fit the top of the hive and allow the hood or cap to the hive to rest down over them, for this arrangement is best used with a hive that has a cap or hood. However, it can be used by putting a wide shade-board over it. Get all the pieces out true and square, after which nail them over a true square form, so that each wide frame will fit true and square against its neighbor, for this surplus arrangement is made out of a number of wide frames."

"Do you use separators on these wide frames?"

"Yes. I advise using separators on or in

any surplus arrangement, for after thirty years of experience I am led to believe that a strictly fancy article of comb honey can not be secured in any other way."

"Can this arrangement be used on the tiering-up plan?"

"Yes, it can be so used by making both tops and bottoms a plump one-fourth inch narrower than the ends. If to be used only one tier high, then have the top the thickness of the tin separator wider than the ends, for the separator is to be nailed to the ends."

"Do you use tin for separators?"

"Yes. After using several kinds of material for separators, I prefer tin to any thing else."

"But doesn't the tin kink and warp when it is nailed to the wide frames? I could never nail it so but that it would."

"The nailing-on of this tin has much to do with our liking or disliking this plan for a surplus arrangement. The first year or two, to prevent the kinking you speak of, I used a hand vise, so arranged that I could pry over one end of the wide frame, after having nailed the tin at the other, thus stretching the tin so tightly that it would fairly ring when hit a little. While thus working one day I noticed that in drawing the tin very taut I often sprung the top and bottom of the frame out or in, as the case might be, and from this I soon had a way of putting on tin perfectly every time. I made a form a trifle shorter than the frame was long, outside measure, this form being perfectly true and square, which gave advantage over the vise method, for with that the frame was sometimes drawn out of true. Next I made a block the size of the inside of the frame, except a little shorter, and of the same thickness as the ends to the frames. To use it I sprung or bent the top and bottom bar a little outward, thus shortening it, until it went into the form, when I laid the tin separator in the proper place, placed a straight-edge on top of the tin, and on this a heavy weight. I now had the tin just where I wished it, with all kinks and bulges taken out, when it was nailed fast to the wide frame. Upon removing the frame from the form, the top and bottom sprang back into place again, thus drawing the separator as tight as a drum-head."

"I am very glad you explained this to me so fully, as it will help me much in nailing separators to wide frames. But having the separators and wide frames all in readiness, what is the next move?"

"They are now to be filled with sections, the same having starters in them, or filled with foundation, as you can afford, while it is best, if possible, to have at least two wide frames filled with bait sections, for each hive you expect to work for comb honey."

"Bait sections! What are those?"

"Simply sections left over from the previous year, that are half or more filled with comb, but which were not sufficiently filled with honey to be salable. These are called baits, because they entice the bees to commence work in the sections much sooner than they otherwise would, because bees will go to work

filling empty comb before they will build new."

"Thanks again. This is something that I never knew about before, and I often wished I knew of some way of getting the bees to work in the surplus arrangement sooner. But having the wide frames all filled and in readiness, what next?"

"The wide frames are to be keyed together. I have tried almost all ways of keying these wide frames together, using in clamps, etc., all of which I did not like, as I wished for a plan that would allow of my using as few or as many wide frames on a hive as I pleased, according to the season and the strength of the colony, from two up to twelve. By most of the other plans we must give just so much room or none, no matter what the season or what the strength of the colony."

"But what keeps the bees from going out at the sides of the wide frames and sections, whether keyed or otherwise?"

"A thin board is gotten out the same size as the wide frame, outside measure, this board having a cleat nailed at either end, so as to keep it from warping or twisting away from the sections or wide frame. In each end of this cleated board a wire nail is driven, and two of these boards are used with each surplus arrangement."

"I see. These boards are to come flat up against the outside of each outside wide frame."

"Exactly. And to hold the number of wide frames together, pressed right up tightly to each other, as in a vise, a coiled wire spring is used, prepared by tying a suitable length of string to one end of the spring. The spring is now hooked over the nail in the end of one of the boards, and, after stretching the spring sufficiently, the string is wound around the nail on the other board on the opposite side, when, with a spring fixed in the same way on the other end, we have the number of wide frames we wish to use, all tightly clamped into a surplus arrangement, which can be handled as a whole, no matter whether the wide frames number two, three, four, or a dozen. And they give all the lateral movement required, so as to use the number to the hive which the apiarist may desire. And they can be taken off as one surplus arrangement, or each wide frame separately, tiered up, reversed, interchanged, etc., according to the views of the most exacting."

"Well, this is quite a scheme, and I am glad I came over, for I now understand better how to work for what I want. But allow me one more question before I go."

"Certainly."

"Do you use any honey-board with this surplus arrangement?"

"When not enough wide frames are on to cover the top of the hive, something must be used to cover the remaining portion. Otherwise I use no honey-board of any kind, unless I contract the hive so that the queen is liable to enter the sections and fill them with brood. In this case I use a queen-excluding honey-board, which keeps her below, no matter how small the brood-chamber."

"What do you use to cover the remaining portion of the top of the hive, when only a few wide frames are used?"

"Where a cap or hood is used over all, I use a piece of enameled cloth, or an old bee quilt; and where no hood is used I have pieces of board of different sizes, to suit a certain number of wide frames, these pieces covering that portion not covered with the number of frames used. But the quilts and the hood are best for this arrangement."

"Well, I must be going. Good night."

"Good night."



POLLEN IN THE SECTIONS OF SHALLOW BROOD-CHAMBERS.

Mr. Editor:—Will you kindly permit me to reply to Messrs. A. J. S. & Bro., of Virginia, who write me they have decided to use the Danzenbaker super arrangements, but say there seems to be trouble about the story of pollen in the sections, with shallow brood-chambers? If I can guarantee there will be no such trouble they will reduce their old hives to fit my fixtures. Infer this "trouble" has been brought to their notice, as it has to that of others, by Dr. Miller's Straw in GLEANINGS; and I desire to say to them and others whom it may concern, that there is nothing of the kind with proper or even ordinary management. The 10 frames, 7½ inches deep, of my hive, contain a trifle more comb surface than the eight-frame Dovetailed hives, which gives ample room for pollen, and brood of average queens during the honey-flow.

Bees naturally store pollen at the side of and beneath the brood-nest in the coolest part of the hive, and the honey above the brood in the warmest part of the hive, but never store honey beneath the brood or in cells that have a drop of honey in first, but will store honey in cells partly filled with pollen. In case the brood-nest becomes gorged with honey before the supers are put on, or they are put on too long before the flow begins, there might be a few cells of pollen stored in the sections; but I have not lost a dollar on that account in ten years. I have in that time raised and sold thousands of sections from my hives, without any show of pollen in the sections.

Bees gather very little pollen during the white-honey flow. If supers are put on at the right time, and made nearly air-tight by waxed-paper mats or enameled sheets, with ample covering to retain the bee heat, and render the super the warmest part of the hive, the bees will store their honey there, where it ripens soonest, and store pollen in the cooler part of the brood-nest.

Thousands of shallow seven-inch frames were used with full satisfaction, before I ever tried them, by such men as Dr. G. L. Tinker, New Philadelphia, O.; Dr. Geo. W. Brodbeck,

Los Angeles, Cal.; C. H. Dibbern, Milan, Ill.; M. M. Baldridge, St. Charles, Ill.; Wm. L. Ewing, Vincennes, Ind.; Z. T. Hawk, Audubon, Ia.; H. Bandy, Clinton, Mich.; M. J. Bundy, Angola, N. Y.

F. DANZENBAKER.

Washington, D. C.

[The presence of pollen in Dr. Miller's case may be more a matter of locality than of improper management. However that may be, we hear little of this kind of trouble in connection with the 7-inch brood-frames.—ED.]

CARRYING COMB HONEY ON WAGONS—HOW SHOULD IT BE LOADED?

Friend Root:—In regard to loading honey, page 883, I am of the opinion *you* are correct. I have hauled a good many bees and considerable honey, both in sections and extracting-frames, and have always loaded lengthwise of the wagon, spring or no spring, and have never broken a comb when crossing bridges, culverts, or ditches. The jar is entirely lengthwise; also in stopping and starting the team; and even the ruts often let both wheels drop at the same time. But the rule is with ruts, there is not much of a drop, for the descent and ascent are gradual; and when there is a drop of one wheel in a single rut, the bump is more downward than sidewise.

Hillsboro, Wis., Nov. 26. ELIAS FOX.

MAKING SALVE FROM PROPOLIS.

On page 921, Dec. 1, Mr. Holtermann speaks of making salve by heating propolis and sweet oil. I tried to mix propolis and sweet oil by heating. I stirred it on the stove until I was tired, then took it off the stove and stirred it until it was cold. I then had a solid piece of propolis lying in clear sweet oil. The only way that I have been able to mix propolis and sweet oil is by pulverizing the propolis and then rubbing the oil and propolis together.

MAGGIE M. JOHNSTON.

Malvern, Iowa, Dec. 15.

WINTERING UNDER SNOW.

The place I have selected for my apiary is the most convenient in every respect. But there is one thing that might prove to be a drawback—that is, in severe winters the snow drifts four and five feet deep, and packs so hard it would nearly hold a horse. Would bees (weak colonies as well as strong) live under this snow until it melts?

Troutdale, Ore., Dec. 4. F. E. BATES.

[I think your bees would winter all right.—ED.]

PULSE RATE IN COLORADO.

Mr. Editor:—In your issue for Nov. 15 you say you wouldn't live in Colorado if you were paid for it, because your pulse rate is so high here. I venture the opinion that your health would be greatly improved by a year's residence here. Your pulse rate becomes high here because of deficient lung capacity, which would certainly expand, and then the pulse rate would return to its normal state.

S. W. MORRISON, M. D.

Ignacio, Col., Nov. 24.



J. M., Utah.—It is impossible for us to give you proportionately the amount of sulphuric acid to use in water for refining wax, as so much depends on the condition of the wax, its color, whether it is in the form of old combs or wax cakes; but I would use about a spoonful of sulphuric acid to about a quarter of a pail of water. Put the kettle on the stove; and when the water is hot, put in the wax. After it is thoroughly melted, set the kettle on the back of the stove and allow it to stand over a low fire for half an hour, but not long enough to let the wax cool. Then drip off the wax carefully into receptacles. If the wax has not attained through the process the proper color, the next time use a little more acid; and if the wax after refining smells a little of the acid, use less.

W. B. P., Cal.—If the combs that you transferred into Hoffman frames are crooked, you can still straighten them. Such combs should be placed in a warm room or in the sunshine, after which they should be laid on a flat board, and then forced back into position again with the palms of the hands, or even with another flat board placed on top. Yes, you could get the bees to draw out foundation in the upper story in the manner you suggest. To do this, take out a frame of brood from below with the queen and bees; put this in the upper story, and then place between the two stories a perforated zinc honey-board. The bees will gradually work upward. When the brood is hatched out, if it is along in the fall they will desert the lower combs for the upper ones. If it is during the honey-flow the combs below will be filled with honey, which can be taken out and extracted, after which they may be straightened or put into the solar wax-extractor to be rendered up into wax.

O. P. H., Texas.—We do not sell the apparatus for measuring bees' tongues. It consists simply of a machinist's steel rule that you can get at any large hardware store, one, two, or three inches long, having on one side an inch marked off into hundredths. This, together with an ordinary 15-cent or 20 cent magnifying-glass, 10 cents' worth of chloroform, and two darning-needles, constitute all the apparatus that is needed. Catch a few bees whose tongues you desire to measure; put a few drops of chloroform on a common handkerchief, and place it directly over the wire cloth of the cage; and when the bees are stupefied, cut off the head of one bee, lay it with the tongue stretched out on the rule graduated to hundredths. Stretch the tongue as far as it will go, by pressing upon the head or face of the bee. Count off the hundredths from the point where the tongue leaves the mouth to its end. This is a very simple operation, and any one with a little skill and patience should be able to do the work as well as an expert.



MILD weather, la grippe among men, and good wintering among bees.

SIXTEEN extra pages this time, and more to follow in our next. We still have on hand a large amount of good available matter that is still waiting a place in our columns.

DOOLITTLE IN ARKANSAS.

FOR some weeks past, our old Borodino correspondent has been sojourning at Ft. Smith, Ark. He has rented a farm of 135 acres at Ursulo for a term of five years. In a letter just received from him he says he enjoys the sunny South during winter, but has concluded that, on the whole, he is better off at his old home at Borodino, N. Y. It appears from this that the bee-keepers of the Empire State can still claim one among their number whose writings are, perhaps, as familiar as those of any writer on bee-lore in all beedom.

THE OFFICIARY OF THE NATIONAL ASSOCIATION.

MR. ARTHUR C. MILLER, of Providence, R. I., in referring to the editorial in Jan. 1st GLEANINGS, in which mention is made of the good work of the National Bee-keepers' Association, says no statement is made as to where in the United States the Association has its head, who its general manager is, or who any of its officers are, nor how, when, and where outsiders can get into it, and thus receive the benefits of the organization. I have looked up the editorial in question, and find that I must plead guilty to the charge; but I have said so much about General Manager Secor, and about sending \$1.00 to him, I supposed that every one would certainly know all about the organization, and all I needed to do was to make bee-keepers see and know that the Association was doing something, and a very important something too.

Perhaps it would be well to keep a *standing* notice in our columns, giving the names of the officers, or at least the General Manager and the executive board, and here they are:

E. R. Root, President, Medina, O.; R. C. Aikin, Vice-president, Loveland, Colo.; Eugene Secor, General Manager, Forest City, Iowa.

To get into the organization, and thus be entitled to its benefits, at the same assisting in the good work, send \$1.00 to the General Manager as above named. This will entitle you to membership for one year, securing for you protection against dishonest commission men, against town councils and disagreeable neighbors, and at the same time giving you the additional benefits resulting from the fight against adulteration. It should be understood that one who is not a member can not justly expect the protection of the Association unless he joins *before* he gets into trou-

ble. There may be cases in which a large principle is involved, where it may be necessary to defend some one who was not at the time a member of the organization; but these cases are rare.

INDOOR V. OUTDOOR WINTERING AS DISCUSSED AT THE ONTARIO CONVENTION AT NIAGARA FALLS.

AT one of the sessions we listened to a valuable address by Prof. John Fixter, of the Ottawa Experiment Station. In this he detailed an interesting series of experiments that had been conducted under his direction for four, five, and six winters by the station, on the various methods of wintering bees indoors, underground, and even outdoors. A series of colonies of average strength in common Dove-tailed hives were set apart in pairs, and prepared in various ways as follows:

Experiment No. 1. He had put two hives in a cellar under a dwelling. Under the back end of each hive was placed a three-inch block by means of which the hive was raised so as to insure free ventilation. The regular outdoor covers were removed, and replaced by cushions made of chaff, 4 inches thick, and long enough and wide enough to lap over the hive all around about two inches. The temperature of the cellar varied from 46 to 47. The bees were very quiet all winter, only a sort of hum being noticeable at times; and at such times cold air was let in by opening slides in the doors of the cellar at night, and closing them in the morning. The average loss of stores for a period of six years was 11 lbs. 1½ ounces.

Experiment No. 2. Two colonies were put into the cellar, having the covers and bottoms on just as they were out in the bee-yard. They were watched for dampness to compare the amount of honey consumed. During December and January the bees in both hives made considerable noise. Drops of water were noticed along the entrances of both hives. The colonies were removed from the cellar in the spring in fair condition, but the combs were slightly moldy. The average consumption of stores for six years was 13 lbs. 1¼ ounces.

Experiment No. 3. Two other colonies were placed in a root house. The covers were removed, and replaced by large chaff cushions. Between the bottom-boards and the hive proper were inserted four blocks, two inches high, one at each corner. The house was opened frequently, to put in and take out vegetables. The temperature varied from 38 to 40. The bees made considerable noise. Along in March the hives showed signs of dysentery, dampness, and mold. The average consumption of stores for four years was 14 lbs. 4 ounces.

Experiment No. 4. Two colonies were prepared by being raised off the bottom-boards two inches. The covers were removed, and in their places were put chaff cushions. Hives were then put into a pit 3 ft. wide, 3 ft. deep, and 10 ft. long. At each end of this trench there was a ventilator. This pit was then covered with cedar poles; over these a layer of

straw, and over all a foot of soil. Arrangements were made for taking the temperature during the winter. The mercury showed 38 to 39 degrees F. The loss of stores during the four years was 11 lbs. 4¼ ounces.

Experiment No. 5. Two colonies were prepared for the house-apiary, having chaff cushions on top with a space of two inches between the hive-body and the bottom-board. The hives were removed a foot from the wall, and covered above and all around with a double thickness of sacking, and outside of this was a foot of cut straw. The average loss of winter stores was 15 lbs. 15 ounces for a period of four years.

Experiment No. 6. Two colonies were put into a cellar with the bottoms of the hives left just as they were brought in from the beeyard. The covers were removed, and nothing was left on except the quilts sealed down with propolis. The entrances were left wide open. During the entire winter the bees remained perfectly dry. The average loss of stores was 11 lbs. 7½ ounces for four years.

Experiment No. 7. Two colonies were put into the cellar, covers were removed, and chaff cushions put on top. The front of the hive was tilted up with a three inch block placed between the bottom-board and brood-chamber, making an entrance 3 in. across the whole front. The bees thus prepared wintered the best of any, showed no uneasiness of any kind during the whole winter, and came out in the spring in excellent condition. The average loss during a period of four years was 10 lbs. 8¾ ounces.

Experiment No. 8. Two colonies were left on their summer stands with extra packing all around their sides and on top. The cover was removed, and replaced by chaff cushions. No flying took place from Nov. 12 till April 7. On the 15th of April the hives were taken out of the packing-case, and found to be deserted. The frames were dry and clean, and had an abundance of sealed stores. The average loss in weight, including live bees during six years of trial, was 19 lbs. 1½ ounces. During only two seasons did the bees come out in fair condition.

Prof. Fixter's conclusion was that, in the locality where he tried the experiments, where the temperature would go below 15 below zero, outdoor wintering was wasteful and expensive, both in stores and bees, and he would recommend wintering in the cellar. The average loss from good indoor cellar wintering in stores was about 11 lbs., while the average loss of the outdoor-wintered colonies, even when they came through alive, was almost twice as much, or 19 lbs. The experiment in the root-cellar showed that, while bees can winter in a room or repository subject to frequent disturbance, yet they will do much better in a quiet cellar.

At the conclusion of the professor's interesting address a lively discussion followed. While the majority seemed to favor indoor wintering, some among this number, prominently among whom was Mr. Darling, took the ground that it is a bad practice to leave the bees in the cellar too long. Mr. J. B.

Hall, a bee-keeper of large experience, and whose opinion is valued most highly by the Ontario Bee-keepers' Association, winters both indoors and outdoors. He seemed to feel that, although outdoor-wintered bees consumed more stores, yet they were enough stronger to make up for the extra consumption of food. Had it not been for Mr. Hall I should have drawn the conclusion that for Canada, at least, indoor wintering was the only method. But when Mr. Hall said he wintered half of his bees one way and half the other, the inference was that what was gained in one case was offset by greater strength and vigor of bees in the other.

There is one thing certain: Indoor wintering, where it is very cold, causes a very much smaller consumption of stores than outdoors. Now, then, is it true that outdoor-wintered bees are always stronger in spite of the extra consumption of stores?

SPRAYING FRUIT WHILE IN BLOOM; VALUABLE EXPERIMENTS CONDUCTED AT THE GENEVA EXPERIMENT STATION, N. Y.

At the convention of the New York State Association of Bee-keepers' Societies, held in Geneva on the 9th of January, we had the very great pleasure of listening to an address by Prof. S. A. Beach, of the Geneva Experiment Station, detailing a very interesting series of experiments that were instituted to determine the advantage, if any, of spraying trees *while in full bloom*. These investigations had been requested by a certain class who believed that spraying during the time that the trees are in full flower was essential to the best development, growth, and maturing of the fruit. Prof. Beach called attention to the fact that a certain manufacturer of spraying-outfits, had sent circulars broadcast over the country, advocating and urging the administering of poisonous mixtures during the time that bees work on trees. Then there were also some among the fruit-growers of New York who advocated spraying at such times, but who could not carry into effect such practice because a law had been enacted in 1898, making it a misdemeanor for any one to spray during the time the trees were in bloom. Some of the fruit-growers (not all) sought on several occasions to have this law repealed; but being foiled they finally secured the passage of an amendment which provided that trees might be sprayed during blooming-time for *experimental* purposes. The object of this amendment (and it appears the bee-keepers did not object to it) was to determine whether there was any advantage in spraying when the trees were in full bloom, irrespective of any damage that might accrue to the bee-keeper. As a result of this amendment a series of experiments was begun at Geneva, and also at Cornell.

In the conducting of the experiments, Prof. Beach stated that several questions were kept in mind: What was the effect of spraying while the trees were in bloom? did the spraying at such times affect the blossoms? did it kill the pollen? and if not, did it affect the setting or the development of the fruit? what part did the bees play in the matter?

Some bee-keepers, he stated, were inclined to make sweeping assertions, to the effect that no fruit could set without the agency of the bees. This was altogether too strong a statement. That bees did play a most important part in the fertilization of some kinds of fruit-trees could not be denied. That question might be considered settled.

In the experiments that had been conducted, it was found that the blossoms that were sprayed just at the time they were in full bloom were either killed or injured. If the spraying were administered only during the blooming-time the poisonous mixtures did not go to the right spot, in a good many cases, for the simple reason that no cluster of apple-blossoms, for example, opened out at one and the same time. Some blossoms would be closed, and impervious to the effect of the spraying-liquids; and if no more spraying were administered after blooming-time, then those blossoms that were not open would not receive the benefit, and the fruit-eating insects would then get in their work. The professor brought out the point clearly, that if spraying were applied before blooming and after, the leaf-eating insects in the first case, and the fruit-eating insects in the other, would be destroyed.

He further showed that the spraying-mixtures are exceedingly harmful to the development and growth of the delicate pollen. Some pollen was gathered and taken into the laboratory and mixed with a thin syrup, then afterward a quantity of spraying-liquid was applied, of about the strength that is used in spraying trees. It was found in every case that the pollen failed to grow. Then the spraying-liquid was reduced 50 per cent, and still mixed with pollen and syrup which had been prepared, and still the pollen grains failed to grow in most cases. The professor said he was decidedly of the opinion that spraying during blooming-time was exceedingly harmful to the delicate reproductive organs, and to the pollen itself in the flowers of the fruit-trees. He referred to a certain Mr. Kellogg who had tried spraying strawberries while they were in bloom, and much to his sorrow. He mentioned a number of instances of fruit-men who formerly had believed that spraying during blooming-time was the correct practice, but had now been completely converted.

In the experiments that were conducted in four orchards located in different parts of the State, a certain set of trees were set apart and sprayed while in bloom, and only then, and others were not sprayed. Even though the bloom was exceedingly abundant, it was found that those trees that were *not* sprayed during blooming-time yielded from a third to a bushel and a half more of fruit. In some cases they sprayed a half of one tree *several times* during blooming time, leaving the other side of the tree not sprayed. There was a marked difference in the setting of the fruit on the two sides of the trees, and that difference was decidedly in favor of the side not sprayed. Experiments were conducted in fruit-orchards in different parts of the State; and in one instance, at least (the professor

would not give the name) a certain fruit-man who believed that spraying during blooming-time was the right thing to do, estimated, after he had sprayed his whole orchard at such time, that he had lost nearly a thousand dollars. He had had enough of that business.

The professor stated, however, that there was one instance when spraying right during blooming-time might prove to be advantageous; and that was, to kill the apple-scab that might come on at just that time; but even in such a case it has not yet been proved that spraying before and after bloom may not be equally efficient. But, generally speaking, the conclusion seemed to be that spraying during blooming-time was not only wasteful but decidedly harmful as well, cutting down the supply of fruit to an extent that, if generally practiced, would amount to thousands of dollars to the fruit-men all over the State.

On the evening of the first day we listened to an excellent address from another professor of the same station—Prof. V H. Lowe. The experiments that had been conducted under his direction were for the purpose of determining the value of insects in pollenizing fruit-blossoms. A certain set of nine small pear-trees (it was not practicable to use large ones) were enveloped in a hood of sheeting. This hood was large enough to slip down over the whole tree, something in the form of a bag—the bag tied at its bottom around the trunk of the tree. The object of this was to keep out insects, ants, bees, or any thing that might assist in pollenizing the blossoms. For the purpose of ventilation, some windows were made in the sheeting, and the openings covered with a fine netting. On all of these trees so covered, there was a large number of buds, and all the conditions were favorable for a good crop, except that the flight of insects was entirely cut off. Now, then, for the results: Out of the whole lot of trees covered, there was just one fruit. On another set of trees not covered there were 145. In the other case, where it was not practicable to envelop the whole tree, one large limb, for instance, would be inclosed in the bag, the mouth of the bag being tied around the trunk of the limb. In one such instance there were 2483 buds of an apple-tree that were thus covered with the sheeting. Out of that number just one fruit matured. There was plenty of fruit on other portions of the tree where the limbs were not covered. In one case, where the sheeting broke open so that insects could get in, there were 13 perfect fruits from 818 buds. It was clearly shown that bees or other insects play a most important part in the pollination of average fruit-trees. When the professor was asked how much of this pollination was attributable to bees and how much to other insects, he said he could not tell; but Mr. O. L. Herschiser, in referring to a similar set of experiments made some years ago at the Michigan Agricultural College, showing the same results, said that the bees were altogether the earliest insects out; that at the time the average fruit-tree is in bloom it is too early in the spring for other insects to be of any value. In his opinion the covering of the limbs or the

covering of the whole tree as explained by Prof. Lowe (with the result that little or no fruit had set) showed clearly that the bees, and they alone, did the mixing of the pollen.

At the conclusion of both addresses, both professors were given a most hearty vote of thanks for the interesting and valuable testimony they had produced; and this testimony was the more valuable because both men began these experiments at the solicitation of the fruit-men, anxious to show that spraying during blooming-time was not detrimental but decidedly advantageous. Verily the bees in York State have been and are being vindicated on every hand.

President Marks said he had made the statement that 95 per cent of the bee men of the State were also fruit-growers. He wished it understood that a large number, yes, the majority of fruit-growers, acknowledged that the bees were their best friends; that it was only a few of the fruit-men who were at variance with the bee-keepers; that there was no real fight between bee keepers and fruit-growers.



The effectual fervent prayer of a righteous man availeth much.—JAMES 5:16.

Dear friend, do you know of somebody who is very kind, accommodating, skillful, and helpful in every way when he feels just like it; but when he does not happen to feel just like it he can be as contrary, disobliging, and vexatious as he is at other times good-tempered? I suppose such people are all over the world. When you take them just right, or when they happen to feel like it, they are most estimable people and valuable citizens. At other times they are so contrary, disobliging, and *ugly* (to get right down to it), that it is hard work to live near them and be obliged to have any thing to do with them.* May be you remember having got hold of a certain hired man or girl who was of this sort. When she or he first began work you wondered how it was that he changed places so often, and

* Sometimes a man is wanted for a particular job—oftentimes something of very great importance. The question is, "Who can do it?" Finally we hit upon a man who would fill the bill exactly, providing he took a notion to. Sometimes the question comes up before a committee. This man is peculiar. If the right person should present the subject to him when he happened to be in one of his accommodating moods he might fall in with it and do it to our entire satisfaction. Again, if somebody he did not like should present the matter, or he did not happen to be in an "accommodating mood," he would refuse to have any thing to do with it, and, may be, declare flatly it could not be done. A great many times I have met just such contingencies. It is not only in business matters, but in temperance work, and in various greatly needed reforms. We can not say we will have nothing to do with one who is so changeable (and we might almost say untruthful); for sometimes it seems as if the world could hardly get along without them. All we can do is to make the best of circumstances and of the people we meet. Earnest prayer and patient labor are the two things needed, and a broad charity for those who are beset with these human infirmities and weaknesses. May God help us.

yet was so reasonable in his charges. As time passed, and you became a little better acquainted, little by little this person began to show out his moods and streaks and inconsistencies, and then the secret was out. What are you going to do with such people? Somebody said a while ago she would not have a girl on the premises who would tell deliberate falsehoods. But, my friend, you can not very well lay down rules. I have sometimes thought these people I have described did not really *mean* to tell a falsehood, and that, in fact, it hardly ought to be called a falsehood. Your hired girl or man gets one of these streaks, and declares the thing you want done can not be done. You explain fully what is wanted, and tell him you could do it yourself easily if you had time. But, unfortunately, a bad spirit has got hold of the otherwise usually skillful and ready helper. He insists it can not be done, gets contrary, and pretends he did not understand just what you wanted. The result is, wasted time and loss of property. There is a controversy or conflict between you two, and the hired man comes out ahead. May be it is the hired woman or hired girl who comes out ahead. In one of our Home Papers recently I expressed a dislike for the term "hired girl;" and just as I expressed a dislike for it a writer suggested that we say "housemaid." The woman of the house is the housekeeper, or housewife, if you choose. Her helper is the housemaid. Well, now, this housemaid, or hired man, as the case may be, thinks he is telling the truth when he said he did the best he could. If you question him, perhaps he will insist that he did the best he could, and furthermore declare, perhaps, that the thing you wanted can not be done. May be by this time you are sufficiently stirred up so you drop other important duties, and go to work and show him just how easily the thing can be done if one goes about it in the right way; or perhaps you call in somebody else who has not "got his back up" on this particular matter, and let your hired help see you are right. Is he convinced, and does he beg your pardon? Generally speaking, he does not. He is still contrary; and this is one of the sad phases of humanity. Perhaps somebody puts in right here, "Get rid of him." But, my dear friend, this same person has many grand good qualities, and he has many lovable traits. He can do things that nobody else can do or has learned to do. You can not afford to let him go, unless, indeed, you let the same spirit into your heart that has found a lodging-place in his, and "cut off your nose to spite your face." I beg pardon for such a piece of slang, but it just hits the spot. Perhaps some of you say, "Well, Bro. Root, what would *you* do? or what *do* you do under such circumstances?" In the first place, I try to keep my temper. If you lose your temper you have stepped down from the throne where reason holds sway. You are standing exactly on the same level with your contrary man. "He that ruleth his own spirit is greater than he that taketh a city." But if you get stirred up you can not take any city at all; in fact, you can not

capture one single commonplace individual. The man who allows himself to get angry is like one who has let go of the lines with a runaway horse—yes, even when even his very life *depends* on a firm steady hand. Therefore do not let your opponent see he has vexed you. Very likely that is just what he is trying to do. When you have got the contrary spirit all out of your heart, then you are ready for our text, especially the latter part of it—"the effectual fervent prayer of a righteous man availeth much." *Pray* for the man who vexes you. Some of you, especially those who do not believe in prayer, may say, "Why, Bro. Root, the whole thing is preposterous, to pray for a man who has spoiled your property, wasted your time, and then looks you fairly in the face, and *lies*."

I know, dear friends, it is demanding a good deal of humanity—especially untrained humanity. It is easy enough to read over the words, "Pray for those that despitefully use you" when you are not in conflict with somebody; but to ask a man, right when he is greatly vexed, to stop and to try to pray for the man who acts in the way I have described, is a pretty hard thing to do. I know, because I have tried it; but, O dear friends! it is the *only* road from earth to heaven; it is the *only* way to save the world from sin. Our text says the prayer of a *righteous* man availeth much. If you are contrary, ugly, and untruthful, like your hired man, there is no promise that the prayer will avail; and, oh dear me! I have come now to the saddest part of my talk.

When I was trying to describe to you the contrary hired man or housemaid it kept forcing itself on me that I was almost unconsciously describing my poor self, or at least a part of myself that *too often* comes in sight. While I think of it I can only say, "May God have mercy on *me* a sinner."

If I, then, am ready to acknowledge that I am one of the contrary sort—one thing at one time and another thing at another—what right have I to expect my prayers shall amount to any thing? Well, in one sense I have not any right; but the dear book says (thank God) that Christ Jesus came into the world, not to save the righteous, but to bring *sinners* to repentance. We read, too, "Him that cometh to me I will in no wise cast out," and this includes sinners like me and everybody else. Now, then, dear brother or sister, do not turn off your housemaid because she has a fashion of behaving as I have described. Pray for her—pray that the spirit of Christ Jesus may get into her heart and drive out this spirit of Satan. Do not forget to include yourself and your own heart in this plea to the great Father above. When you are off by yourself in your own closet, where none but God can hear, you can say, if you choose, "O God, have mercy on *both* of us. Help me to set a good example; help me to forget these unpleasant acts and untruthful words; and may the Holy Spirit rule and *guide* both of us." O dear friends, you do not know how such prayers help. I have seen men and women transformed in just a little while. Yes,

I have been so astonished at the result of such prayers that I have gone off by myself again and again, just to thank the dear Savior, and to ask him to forgive my want of faith—to forgive me for not having faith to believe that such blundering prayers from a heart already stumbling and blundering *so far* out of the straight and narrow path should avail so much. Oh how I do like those two words, "avail-eth much"!"

Suppose you have forgotten yourself, and ordered your impudent, untruthful hired man off the premises. Would it have made him behave any better with his next employer? I do not believe it would, especially if you are a professing Christian. He would have gone away soured against all the world—professing Christians especially. Years ago I had a man working for me whom I had taken from our county jail. In just a few days there was a fight started between him and one of our regular men. I got between them, and, after a good deal of hard work, had the two shaking hands, and begging pardon for the misunderstanding. He told me afterward that he had been in lots of fights during his life, but he never before saw a fight end in that way; and I am afraid his experience is too much like that of a good many others.

Our text enjoins us to confess our faults one to another. Of course, the man who employs some one to work for him must preserve proper dignity. If your hired man sees that you are afraid of him when he gets contrary, he may undertake, especially if he is one of the ignorant sort, to take advantage of you. The matter should be settled in the outset that you are to direct things and he is to work according to directions. If he is a reasonable man he will agree to this; but, sad to say, it is not the hired man and the housemaid alone who are sometimes one thing and sometimes another. We have neighbors who act in the way I have described; yes, we have sisters and brothers *in the church* who seem to forget themselves, and think it no very serious thing to be contrary; and, oh dear me! I almost forgot to say that we have employers who will be pleased with work at one time and at another time get into a mood so they would not be pleased with any thing, and scold and make a fuss when every thing is all right. Yes, there are housewives who are this way. There are policemen and sheriffs who let a man go scot free at one time, and then take him up at some other time for a very trifling offense as their mood changes. And we really can not stop with policemen and sheriffs. I have seen judges on the bench, who, because they were prejudiced against a certain one who was in their power, would so far forget themselves and their—I almost said *sacred* calling, for the man who is chosen to hold the property and sometimes the life of a fellow-being in his hands does have a high and sacred duty and a great responsibility on his shoulders. Yes, even judges on the bench, I am sorry to say, sometimes let little personal spites or prejudice for or against certain persons warp and bias their decision. May I suggest that not only the governors of our

States, but even the President himself, does, at times, show, let us say, "human weakness" in the direction I have been talking about. May God help us, not only in dealing with the hired man and the housemaid, but in whatever we have to do with the affairs of the town, city, State, and nation. May we also remember that the fervent effectual prayer of a righteous man availeth much.

Dear friends, as we step out into this new century we have certainly one thing to rejoice about and to thank God for—the decision of both House and Senate in regard to beer among the soldiers. For a time it seemed as if those in power were all against us; but we are, as a rule, a praying people. I knew of the fervent prayers of righteous men and women that were ascending to the great throne of Him who judges all the earth, and in view of this I ought not to have been surprised when some of our great officials in Washington said they would vote for the abolition of beer, not because they *believed* it was best, but because of the *importunities* of the people. Truly the fervent prayer of a righteous man does avail much, not only in humble places but at the very head of our government. Let us have faith, and let us believe that, if we follow the teachings of God's holy word, we shall prevail, not only in the home and on the farm, but at the very head of the government of this nation.

In closing, permit me to quote some beautiful words that came from the Bible Truth Depot, Williamsport, Pa. :

When you are forgotten or neglected, or purposely set at naught, and you smile inwardly, glorying in the insult or the oversight—that is *victory*.

When your good is evil spoken of, when your wishes are crossed, your tastes offended, your advice disregarded, your opinions ridiculed, and you take it all in patient, loving silence—that is *victory*.

When you are content with any food, any raiment, any climate, any society, any solitude, any interruption—that is *victory*.

When you can bear with any discord, any annoyance, any irregularity, unpunctuality (of which you are not the cause)—that is *victory*.

When you can stand face to face with folly, extravagance, spiritual insensibility, contradiction of sinners, persecution, and endure it all as Jesus endured it—that is *victory*.

When you never care to refer to yourself in conversation, nor to record your good works, nor to seek after commendation, when you can truly "love to be unknown"—that is *victory*.

PLACING THE NEGRO ON THE SAME FOOTING WITH WHITES.

I have been accused of this in our two last issues; but permit me to plead not guilty. All I undertook to do was this: To hold the colored people responsible for their behavior, which is something they *can* help, but not hold them responsible for the color of their skin, which is something they *can not* help. Where I spoke of having a colored man or woman sit down with me at my table, I suppose I gave the most offense to some of my good friends in the South. My position was and is that behavior should decide whether he is fit to sit at the table, and not color. Who-

ever works for me, outdoors or in my home, I shall try to teach good manners, truth, and righteousness; and if having a person sit down with me at the table, say once a day, would help in lifting him up, I should be willing to put up with whatever inconvenience it might cost. If he persistently refused to be decent and respectable, I presume I should give up the experiment. Quite a number of letters have come, protesting against what I have written along this line. Just *two* have ordered their journals stopped. But there is one other subscriber who said he had decided to take GLEANINGS another year just *because* of my defense of the colored people; so at present writing we have lost only one subscriber. The *Country Gentleman* was so well pleased with my treatment of the hired girl that the editor copied my article entire, and here is what he says at the conclusion of it :

One of the editors of the *Country Gentleman* has employed only colored servants for fifteen or twenty years; and it is fair to add that in all the number there has never been one that was not scrupulously honest.

Perhaps the colored help mentioned in the above were brought up in the North. And then another fact seems to stare us in the face right here. It makes a difference as to whom the colored help (or white help either, for that matter) is working for. Some employers would discourage any form of dishonesty at the very outset, and I am sorry to say there are others who would without meaning it tend to encourage it.

In regard to Tuskegee, so large and influential a periodical as the *Outlook* has just employed Booker T. Washington to write them a series of articles in regard to his industrial school and his lifework.

Now, dear friends, I am sorry to have even *one* of our readers order his journal stopped because of any thing I may do or say; but when I feel sure that I am doing "as Jesus would do" I do not know how I can change my views or teachings.

Temperance.

The following from State Superintendent P. A. Baker will certainly be of interest to all Ohio people, and it ought to interest, and I rather think will, everybody else, no matter what State he lives in, especially if he is interested in the matter of getting rid of the saloons.

I presume you have heard of the splendid victory we won last week at Lebanon in putting out 14 saloons, thus adding another county-seat to our temperance belt, making six county-seats in Ohio without saloons. I believe we can make Warren County a dry one in a short time.

The six county-seats referred to in the above are as follows: Lebanon (Warren Co.); Bellefontaine (Logan Co.); Cadiz (Harrison Co.); Jefferson (Ashtabula Co.); and last, but not least, Medina (Medina Co.). Now can't somebody tell us of another county-seat that is almost ready to be included in the roll of honor?



Some of you will remember that in November, 1897, I gave a picture of a hen and chickens, entitled "The Youthful Mother," the White Leghorn pullet that commenced laying when she was 4 months and 16 days old, and in 5 months and 21 days she was the mother of a brood of chickens. I said then I should like an oil painting of the hen and chickens to hang up where I could see it every day. A lady who reads GLEANINGS volunteered to make the picture. It is in our dining-room, where I see it and feel happy several times a day. Well, this youthful mother belonged to O. W. Mapes, of Middletown, N. Y., the "electric hen-man." Ever since reading this story I have had a great desire to visit the electric hen-farm. After I had promised to attend the Utter trial it occurred to me this egg-farm might be somewhere in that part of York State. Sure enough, Middletown is in Orange Co., the same one where the unbrotherly brothers live, just one station away from Goshen. So I started off a day or two ahead of the time for the trial, and, finding we had a bee-keeper in Middletown, I proceeded to look him up. Somehow I had several streaks of good luck during that visit. Mr. C. Belding is not only a bee-keeper, but a gardener and florist, and has been all his life. Just now his boys (like mine) are taking charge of the greenhouse and other business, and letting him take things easy. Friend B. knew all about the electric egg-farm, and kindly volunteered to take me there with his horse and buggy.

Although Orange Co. is one of the richest ones in the State of New York, it contains some stony and hilly ground that is almost unfit for any thing unless it is an egg-farm. All around among these stones and hills Mr. Mapes several years ago started his egg-farm. Little houses to the number of 50 or more are scattered all through among the rocks and hills. For three or four years he had communication with each house by means of electricity. As many of the little buildings are so far away from home, and out among the wilds, it becomes quite necessary to shut the pullets up nights on account of wild "varmints" as they used to express it in olden times. Electric wires open the houses all at once, every morning, and shut the doors every night after the last straggler has got inside. These same wires open the feed-boxes and close them. Now, I do not exactly understand whether it is the same wire or an extra one that does this.

Stoddard and many other good authorities claim, you know, that fowls, to do their best, must have just what they *need* in the way of food, and not all that they will *eat* if they can get it all day long. More than one poultryman, however, has found out that it is a big job to give several thousand chickens just so much and no more. After working the machinery

for three or four years, Mr. Mapes has dropped it; and now as he goes around to the houses every morning to carry feed and water, he lets the chickens out and then makes another trip every night to gather the eggs and shut the hens up. He is satisfied that as good results are secured by giving the chickens all they will eat all day long—that is, certain kinds of food, and food that is just right. Perhaps the expense of the apparatus, and keeping it up, has something to do with it. He has made a great many exhaustive experiments—among others, one in regard to the matter of exercise, the point on which Stoddard lays so much stress. He confined a hen under a peach-basket where she could have no exercise at all except to turn around, and she laid 84 eggs, if I remember correctly, without missing many days. Of course, he gave her the best kind of rations, and supplied every thing as well as he could *except* exercise. I believe, however, he places a value on a reasonable amount of exercise, for his fowl-houses are something like 6 or 8 rods apart all over the farm. With this arrangement all the chickens go "home" to roost. I forgot to ask if he did not have a few gossiping hens that went gadding all over town, stirring up musses and jealousies. Oh! by the way, roosters never quarrel when there are no hens around. In fact, he had thirty or forty in one pen, and they were as brotherly as could be. The hens stir up jealousy and hatred. Come to think of it, I do not think this is true of boys and girls. How is it, young people? Thank God, we are a notch or two higher up in the scale than chickens.

Mr. Mapes keeps almost entirely White Leghorns, like the picture of the pullet I gave you. He gets from 5 to 8 cts. a dozen more for his eggs because the purchaser knows exactly what day they were laid. Every case is sent to New York city, with a certificate that the eggs were laid on such a day, and consequently there are never any bad ones or stale ones. Very likely *you* can not do it unless, indeed, you have as good a reputation for truthfulness as Mr. Mapes has.

Although it was a cold freezing day, as our trip was taken along toward noon, when the sun was warmest, the brooder-houses where the young pullets were kept were opened, and they were allowed to jump, run, and fly over the fields, up hill and down. The brooder buildings were closer together than those for laying hens. I should think that perhaps a hundred half-grown chicks were in each building. A lamp with an ingenious hot-water brooder kept the chickens warm. I expressed a fear they would take cold by going out into the frosty air after being around the hot-water pipes; but the way they cut up and ran there did not seem to be much danger; besides, they had lived in that way till they were fully feathered out, and were as handsome as white doves, and about the same size. You see, if a chick felt cold or tired it could go back into the brooder whenever it felt so disposed. As a rule, each chick goes back into its own home like a bee out of its hive. But their owner said if they got mixed up somewhat it did not

matter. I think he sells the manure to tanners.

Some of his methods for saving time made me think of our veteran friend Doolittle when somebody was asking about being so careful about killing a bee. Friend Doolittle suggested that a man's time was of too much value to wait for one or two bees to get out of the way. Well, Mr. Mapes cures sitting hens by putting them in a rough cage in the upper part of the poultry-house. He does not make any provision for food or water. It would make a great deal of extra trouble, and he says they get over the sitting fever rather *better* for their fast of 48 hours. Fifty fowls have four nests to lay in. I asked him if there would not be too many in one nest. He said they were sometimes even "two or three deep" when laying, but he did not think it mattered. When I asked what kind of nest-egg he used he looked at me in surprise.

"Why, what do you suppose I want of a nest-egg?"

I ventured to suggest, timidly, that they would lay more eggs. I do not remember just his reply, but it was somewhat to the effect that when they were ready to lay the eggs must be put somewhere. Now, I hope I am not presuming, in disagreeing with such good authority as Mr. Mapes; but when one of your biddies plays a trick on you, and slips off by herself, and fixes up a real nice nest, doesn't she get that nest full quicker than if she had to lay in some conspicuous nest occupied by several other hens? Right here in the middle of January, during two or three warm days one of my pullets strayed into a sunny place in an unused open shed, and made a most elaborate nest, and laid an egg in it. I saw her skulking around out of my sight, and I was pretty sure that was just what she was up to. I feel a good deal disappointed because the weather is so cold she can not get off so as to use that nest again to day, for I think she would work harder, and lay more eggs, if she thought she was managing things all on the sly.

Friend Mapes urged us, on our way home, to look in at a plate-glass window on a particular street. What do you think we saw? Why, some 20 or 30 White Wyandotte pullets, the handsomest chickens I think I ever saw anywhere. A beautiful placard right over their heads, plain enough to be read clear across the street, was something like this:

"We have hatched during fair time, last fall. We have been fed all our lives on Mapes balanced ration for poultry. In fact, we have never had any other food. Aren't we beauties?"

And they seemed to be just as happy there in that window during that cold winter day as if they were out in the green fields chasing grasshoppers. The above was an advertisement for a certain firm, I know; but I think such advertisements are all right. Mr. Mapes uses this poultry food very largely in all his operations, and he has a theory that the proper amount of this food, with every thing else kept away, will cure the roup; and this I think he has demonstrated several times.*

Chickens, like human beings, depend largely for their health and happiness on having plenty of pure wholesome food instead of being obliged to drink stagnant water and eat all kinds of filth, as they have to do when they are starved to it.

I feel a little sorry because I am having so much to say about poultry just now, to the exclusion of so many other important matters; but somehow the spirit seems to move me in just that particular direction this winter, and I believe I have got hold of some valuable facts.

Oh, yes! I described to Mr. Mapes my underground tunnel warmed by exhaust steam, and asked him what he thought of getting eggs in winter by having the ground under the poultry-houses dry, and warmed by steam, or even running smoke and hot air through drain-tile or sewer-pipe a foot under ground. He said that, with what experience he had had, he was quite well satisfied this arrangement would give an abundance of eggs when the weather was very cold and the price away up. With exhaust steam, as we use it, he said there was no question about it; but if one had to fire up, and keep a little fire going to warm the ground under a range of poultry-houses, only a test would decide whether it would pay for the *cost of fuel* and some one to look after the fire.



"HIGH PRESSURE"—EGGS.

A short time ago every one was wanting eggs, and there were none to be had. There were none at the stores, but there were a few skillful poultry-keepers who were getting eggs every day. The price ran up to 18, 20, 22, 24, and finally to 26 cts. a dozen; and I am told some people paid 30 cts. a dozen rather than go without eggs entirely. There were two reasons why the hens did not lay. The old ones had not finished moulting, and the young ones had not commenced laying, and it was too cold weather. I made some investigations as to how the skillful ones managed to have eggs at such a time. It was usually a flock of poultry where *women* had the management, and I talked with these skillful women about it. Finally an idea came into my head. A few years ago while visiting friend Boardman at East Townsend, O., he invited me out to visit his hot-beds. This was in the middle of winter; but when he raised one of the sashes, instead of seeing Grand Rapids lettuce and vegetables I saw some fine-looking chickens scratching and having a fine time there under the glass, even if it *was* almost zero outside. The fowls could go from the warm house right out under the glass.

*If you want to know more about this balanced ration for poultry, address L. R. Wallace, Middletown, N. Y.

Now, if you will turn to your A B C book and find the winter view of our own apiary, under the head of "Wintering," you will notice a row of hot-beds running from the factory over toward my residence. This row of hot-beds is right over the pipe that carries the exhaust steam to warm our house. Over near the evergreens there is a hot-bed 12x28 feet. I raised the sashes on this high enough to stand under, making a close warm north wall. You will notice the apiarist has passageways about 6 feet wide so he can get through the line of hot-beds. In order to let the poultry get from one bed to another I made some underground tunnels right beside the exhaust-steam pipe. When I told Mrs. Root of my plan she said, "You will never get chickens to go down into burrows under ground in that way. It might do for wild animals."

Well, I did have some trouble in educating the biddies; but after I scattered corn through that tunnel, and then cut off their rations until they had to go in there or go hungry, they learned the trick; and now my Brown Leg-horns will dive down into that underground passage and out at the other side quicker than a wink. In fact, during very severe weather the underground tunnels have become a favorite place to scratch in and keep warm.

Just as soon as I got the thing rigged, and the fowls had learned how to use it, my pullets all began to lay. You see the ground in these tunnels is perfectly dry—not only as dry as dust, but as warm as dry dust baked in an oven. I have talked with several poultry-men about having steam-pipes, or even flues, a foot or more under ground, right under a line of greenhouses. Just common tiles will do, and you can send either exhaust steam or even smoke, on the plan of fire hot-beds described in the tomato book. This will keep the ground dry and warm. You do not need to have a fire in it every day. When the ground is once thoroughly warmed up it keeps nice and dry for several days, especially if protected so that no rain or snow can get on it. Glass sash does this beautifully. I have talked with several poultry-raisers in regard to this method of keeping the ground warm and dry under a range of houses. They all declare it would be tiptop. The only objection is the expense. Well, with the exhaust steam here that is available, there is no expense except the cost of the apparatus; and with high-priced fowls—that is, where there is a range of houses—the expense of fire enough to warm up the ground under the chickens' feet need not be great. We are told again and again that poultry can not stand dampness; and that dry earth or dry dust is the best remedy for insect enemies and disease. Dry warm earth to scratch in is the natural thing for chickens; and a lot of dry leaves scattered right on the dry warm ground seems to be just the thing. Poultry manure is never offensive, and there never come any bad smells from it, if it drops into the *dry dust*. I was particularly struck with this in visiting poultry-ranches in Florida. The dry clean sand that covers the ground everywhere seemed to take care of the droppings so they were never offensive to

the sight. Well, as soon as I can get a hen to sit I am going to try my hand at raising chickens in those dry underground tunnels. As soon as they can run about I think it will be safe to let them take exercise right under those glass sashes, even if it is zero outside of the glass a foot above their backs—that is, when they are alongside of this warm steam-pipe. One of the beds is to be filled with Grand Rapids lettuce. When the chickens are small we will let them run right among the lettuce-plants. I have before remarked I believe it would pay to grow Grand Rapids lettuce just for poultry and nothing else. This winter I propose to make a test of it. If the lettuce brings a big price we will sell it, giving the chickens the refuse. If there should be no great demand for it, then we will turn our lettuce into eggs, just as the farmer turns his corn into pork before he sells it.

Now while we are getting eggs all the time as I have described, a larger number of fowls in the poultry-house and in the barn (and this is a good warm place also) did not lay an egg during December or January. But, of course, they do not have the warm underground tunnel to run into.



SYRUP-CANS.

We are putting in a stock of a carload of cans of 1-qt., ½-gallon, 1 and 5 gallon capacity. To those wanting cans for syrup we can furnish the one-gallon size, 100 in a box or crate, at \$10.00 per 100; 500 or over at \$9.00; ½-gallon size at \$8.00 per 100; 500 lots at \$7.25; ¼-gallon at \$7.00 per 100; 500 lots at \$6.25. These cans all have a 1½-inch screw cap, with tin seal, with rubber gasket. We have a supply of ¼-gallon cans with 2-inch lever seal, which we offer, to close out, at \$1.00 per .00 less than above; i. e., \$6.00 per 100; 500 at \$5.25. These are perfect, and seal just as tight as any; but we are discontinuing this style, and therefore offer them, to close out, at above special price.

RECORD SAP-SPOUTS.

We can supply the Record sap-spouts at \$1.00 per 100, or \$9.00 per 1000. Sap buckets we do not keep in stock, but we can supply them, shipped direct from the factory in Conneaut, O., at the following low prices:

	10 qt.	12 qt.	15 qt.
I C bright tin	per 100.....13 60	14 00	16 00
I X " "	" ".....15 00	16 00	18 00
Galvanized iron	" ".....18 00	20 00	
Best charcoal tin add	" ".....1 50	1 50	1 50

CLIMAX POULTRY-NETTING.

Our new contract for Climax wire poultry-netting for this season will enable us to offer it for shipment either from here, Chicago, or Georgetown, Conn., at the following very low prices per roll, 150 feet long, 2-inch mesh:

2-inch mesh:	65c per roll.
12 " "	1 00 " "
18 " "	1 30 " "
24 " "	1 65 " "
30 " "	2 00 " "
36 " "	2 60 " "
48 " "	3 30 " "
60 " "	4 00 " "

We have ¾-inch staples for same, at 8c per lb. Climax netting is much stronger than other brands of No. 19 netting, and w'll roll out flat and smooth. It is made with 3-strand rope selvages, and is galvanized after being twisted. It is warranted to last for 25 years in any ordinary exposure.

60-POUND HONEY-CANS AT SPECIAL PRICES.

We have secured in Buffalo, N. Y., a choice lot of second-hand 5-gallon honey-cans, put up two in a case. We are assured that they have been cleaned inside and out with steam, and thoroughly dried before they were repacked in the boxes. We offer them in lots of 10 cases at 50c per case; 50-case lots at 45c per case; 100 or more cases in one order, 42c. Where cans have been properly handled they should be just as good to use a second time for honey as the first, and this price is less than two-thirds what new cans cost at present. There are about 1000 cases in the lot, and they should not last long at this price.

EXTRACTED HONEY.

We have on hand the following lots of extracted honey, which we offer while they last at price annexed:

Lot.	Quantity.	Source.	Price per lb. case or bbl lots
No. 68	18 cases	Cotton	7c
" 75	25 bbls	Basswood	8½c
" 79	1 case	Cotton	7½c
" 80	6 kegs	Buckwheat	6½c
" 85	4 kegs	Buckwheat	6½c
" 88	6 cases	Amber Calif.	7c
" 89	73 "	Light amber	
" 90	2 "	California	8½c
" 93	2 "	Buckwheat	7c
" 94	6 "	Buckwheat	7c
" 95	18 "	Goldenrod	7½c
" 96	2 bbls	Clover	9c
" 97	19 cases	Ratan vine	7c
		Mesquite and horsemint	7½c

BUSINESS AT THIS DATE.

While business was rather quiet through the fall we have had plenty to do since Dec. 1, and are already somewhat behind on our carload shipments. With the several cars we are working on as we go to press we have shipped twenty cars of bee-keepers' supplies, a half of them being exported, and the other half going in various directions. We have orders entered for ten cars more, and others expected before these are completed. Mr. Danzenbaker has been developing such a trade in his hive that he has thought best to put in a carload of stock in Washington, D. C., where those in the East and South can order of him direct. In this connection we might say that the Danzenbaker hive for comb honey is becoming more popular each year, especially in the East.

Special Notices by A. I. Root.

WANTED—SWEET-CLOVER SEED.

If any of you have any, send us a sample and tell us how much you have and what you want for it.

RICE POPCORN, EXTRA FINE.

We can furnish a very superior article of rice popcorn, either for popping or planting, as you choose, for 10 cts. per quart, 60 cts. per peck, or \$2.25 per bushel. If wanted by mail, add 15 cts. per quart for postage.

STRAWBERRY-PLANTS, VEGETABLE PLANTS, ETC.

With all the other business we have on hand at the present time, we are, somewhat reluctantly, obliged to give up dealing in plants. We shall grow choice strawberries, mainly in order to test new varieties, and may offer them for sale at the proper season in tens and hundreds. For any larger quantity, we take pleasure in referring you to Flansburgh & Peirson, of Leslie, Mich. We have just printed for them 15,000 very pretty catalogs of strawberry-plants, seed potatoes, etc. Better send for their catalog, anyhow; and if you send them an order I am sure they will give satisfaction. We have never received any nicer plants than those we had from the above firm.

ADVANCE IN THE PRICE OF CLOVERS.

All of the clovers except white—namely, alsike, alfalfa, white Dutch, medium, peavine, or mammoth, are worth now, bushel, \$8.00; half bushel, \$4.25; peck, \$2.25; 1 lb., 20 cents; 1 pound by mail, 30 cents. The above prices take the place of all other previous quotations; and we can not guarantee them except for

immediate orders as soon as this reaches you. Prices are going up so rapidly it is almost impossible to guarantee quotations one day ahead. Now, then, this is rather bad for the people who are obliged to buy; but it offers a splendid chance for those who are prepared to grow clover seed. If farmers used to make a fair living at three or four dollars a bushel, what should they be able to do at present prices?

STODDARD'S NEW EGG-FARM.

The above book seems to be getting your humble servant into trouble. While many who have purchased it report that, all together, they think it worth what it cost, there are quite a good many who rather lost confidence in A. I. Root when they came to see the book he gave such a tremendous recommendation. Well, friends I first wish to humbly beg pardon. I supposed that such a plan for growing chickens by machinery was in actual operation; but since I have not found it, all you who did not get the worth of your money may mail the book back and I will extend GLEANINGS to the amount you paid for it, and after this I will go slower in recommending nice chicken-books, even if they are full of pictures.

THE PLANET JR. CATALOG FOR 1901.

It seems to me that every one engaged in market-gardening, etc., should send for one of these catalogs, just to look at the pictures. The photos of the grounds of successful high-pressure gardeners ought to be worth a great deal in the way of an object-lesson for one to look at. It shows what crops are possible, and also shows the importance of getting your ground in excellent condition. It gives you glimpses of successful work that you might have to travel a thousand miles or more to see otherwise, describing all the latest improved tools for both man and horse power. We can furnish you the catalog on application, and we can also furnish the tools described in it. As a work of art this new catalog is a gem. It contains half-tone pictures of 28 different farms and gardens to illustrate how these tools are used on growing crops. See advertisement of S. L. Allen & Co., Philadelphia, Pa., on page 117.

THE AMERICAN COFFEE-BERRY, OR EARLY SOJA BEAN.

We have received two communications recently in regard to the value of the above for food. On page 157, 1900, Mrs. Axtell says: "We like them very much; we like the taste of them, and then they are so beneficial to our health. They seem to be nutritious and very laxative. Until using them Mr. A. had to use cathartics every day; now, scarcely ever." Now, this is an important matter where a wholesome food can be made to take the place of medicines. In our next we will give a report of where eight bushels of mature beans were grown on ¼ acre, on poor soil in our neighborhood, and that with ordinary culture. We have secured the crop, and offer it for sale as follows: Pint, 10 cts.; quart, 15; peck, 75; bushel, \$2.50. If wanted by mail, add 15 cts. per quart for postage. Remember, these beans are just as good for coffee as they ever were. Mrs. Axtell suggests using a fourth of real coffee; then you have the coffee taste together with the nourishing properties of the soja bean. Our experiment stations tell us there is scarcely any thing grown with the amount of nutrition in so small a compass as the soja-bean. The crop we offer for sale was planted May 15, and the beans were matured and harvested Sept. 5. Soja beans, same as above, only longer in maturing, peck, 60c; bushel, \$2.00.

OFF FOR FLORIDA.

Providence permitting, I expect to leave home Feb. 4, to be gone until about March 1. Will the friends who usually correspond with me direct in regard to gardening, fruit, etc., please bear this in mind?

CONVENTION NOTICE.

The Wisconsin State Bee-keepers' Association will hold its 17th annual convention at the State Capitol, Madison, Wis., Feb. 5th and 6th.

E. R. Root, editor of *Gleanings in Bee Culture*, will present his stereopticon views on the evening of February 5th. These we know to be highly entertaining as well as instructive, and to be appreciated they must be seen. Since Mr. Root presented these at the Na-

tional Convention he has obtained many new slides which will prove to be instructive and interesting to fruit-growers as well as to bee-keepers.

G. W. York, editor of *American Bee Journal*, and so well and favorably known to many of the Wisconsin bee-keepers, will also be present.

A general discussion will follow each topic, and a free use of question-box and answers will be a prominent and valuable feature.

Excursion rates, within 200 miles of Madison, one and one-third fare for round trip, ticket purchased February 4, 5, or 6 good to February 9. Tickets in Wisconsin, over 200 miles from Madison, same rate if purchased February 4, good to February 9.

N. E. FRANCE, Pres.

ADA L. PICKARD, Sec'y.

Richland Center, Wis.



STEEL WHEELS for your FARM WAGONS

any size wanted, any width of tire. Hubs to fit any axle. No blacksmith's bills to pay. No tires to reset. Fit your old wagon with low steel wheels with wide tires at low price. Our catalogue tells you how to do it. Address
EMPIRE MFG. CO., Quincy, Ill.

For Sale!

A splendid little fruit and bee-farm, in the midst of about half a dozen of the finest summer resorts in Northern Michigan, will be sold at less than one-half its value. Farm contains 16 acres with 1500 choice fruit-trees, nearly all in bearing, 5 to 7 years old, consisting of 300 cherry (mostly sweet), 250 pear, 250 peach, 300 plum, and 400 apple trees, all of them of the most profitable varieties. Also 1½ acres in strawberries, 2 acres in raspberries, 3 acres in clover, and the rest under cultivation for gardening purposes. The soil of the best; ¾ miles from Traverse City (a town of about 12,000 inhabitants, at the head of Grand Traverse Bay, with the largest State buildings in the State), 40 rods from a good school, and good graveled roads all over this part of the country, markets good, climate healthy. The buildings all new, and well built and finished, consisting of house with 7 rooms, upright 16x24, 1½-story, with good cellar, stone wall, full size of this part of house; wing part one-story, dining-room, kitchen and wood-shed 16x36 with soft water in the kitchen. Barn, 16-foot posts, 30x82; hen-house, 12-foot posts, 12x24. All buildings on stone foundation. Plenty of good water. Terms: \$3000; \$1000 down, balance to suit purchaser. Will also sell all of my personals, among them 40 colonies of Italian bees in chaff hives; team of horses, cow, one spring and one lumber wagon, and all other farming tools.

Address J. P. Berg, Box 8, Traverse City, Mich.

Strawberry-plants.

I have a large supply of Lady Thompson, Excelsior, and Crescent plants. A limited supply of Bismarck, Clyde, Barton's Eclipse, Brunette, Gertrude, Brandywine, Wm. Belt, Bubach, Haverland, Gandy, and Warfield, \$2.00 per 1000, f. o. b. here, or 70 cts. per 100, postpaid. Satisfaction guaranteed.

J. P. LEA, Fayetteville, Arkansas.

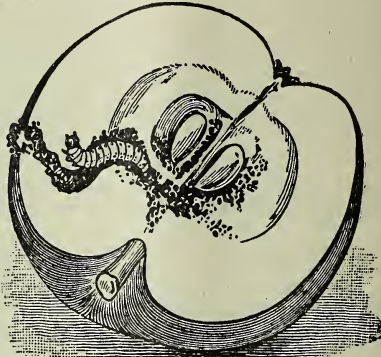
HONEY QUEENS!!

I have them, as daily letters testify. Recent conclusions force the belief that the leather-colored strain of three-banders excels in honey-gathering. If you want Golden's my strain takes the lead of all others, and I have tried them all; 250 colonies for honey, and 200 strong nuclei that will winter over. I am prepared to send you a queen any day you may order. Tested or untested queens, \$1.00. Leather breeders, \$2.50. Owing to increased demand straight 5-band breeders are \$5.00 each.

W. H. LAWS, Beeville, Texas.

SPRAYING FRUIT-TREES.

The question of spraying fruit-trees to prevent the depredations of insect pests and fungus diseases is no longer an experiment but a necessity.



Our readers will do well to write Wm. Sael, Quincy, Ill., and get his catalog describing twenty-one styles of Spraying Outfits and full treatise on spraying the different fruit and vegetable crops, which contains much valuable information, and may be had for the asking.

PRICE OF

Lone Star Queens

AFTER APRIL 1ST.

1 tested queen.....\$1 50
3 tested queen..... 3 75
1 untested queen..... 75
3 untested queens 2 00

We have both the golden and leather color from imported mothers at same price.

Agent for Root's goods.

G. F. DAVIDSON, Fairview, Wilson Co., Texas.



Italian Queens

for early shipment from the South; are reared in full colonies by the best methods known to queen-breeders. Spring prices—full colonies, \$6.00; two-frame nucleus without queen, \$1.50; three-frame nucleus without queen, \$2.00. Add price of queen wanted to price of nucleus. Tested queen, \$2.00; untested, \$1.00; six for \$5.00; 12 for \$9.00. Liberal discounts on large orders. Combs built on full sheets of foundation in wired Hoffman frames. Shipments to the North by New York, Baltimore, Philadelphia, or Boston steamer via Savannah, Ga. **CHRISTIAN & HALL, Meldrim, Ga.**

READY FOR 1901.

We are again ready to furnish our superior strains of Bees and Queens for 1901. We have the best stock of bees that money and skill can procure, as our numerous testimonials prove. We guarantee satisfaction. Let us have your orders. **WE WANT** your name and address for our circular giving valuable information, also description and prices of queens. We have 800 queens wintered over for spring orders, among them 50 fine Golden breeders.

Prices, either Golden, 3-banders, or Holy Lands.

Untested—June, July, Aug., and Sept.—1 75c; 6, \$4.25. Untested—all other months—1, \$1.00; 6, \$5.00. Tested, 1, \$1.25; 6, \$6.75. Sel. Tested, each, \$2.00. Breeders, \$3.00 and \$5.00 each. Discount in quantities, and premiums given away to our customers. Address

O. P. HYDE & SON, Hutto, Texas.

All This Nice Printing only \$1.	100 sheets paper, ruled, 100 envelopes, No. 6, 100 neat cards,	LITHO PRINT, Box 5, Swarthmore, Penn. E. L. Pratt.
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